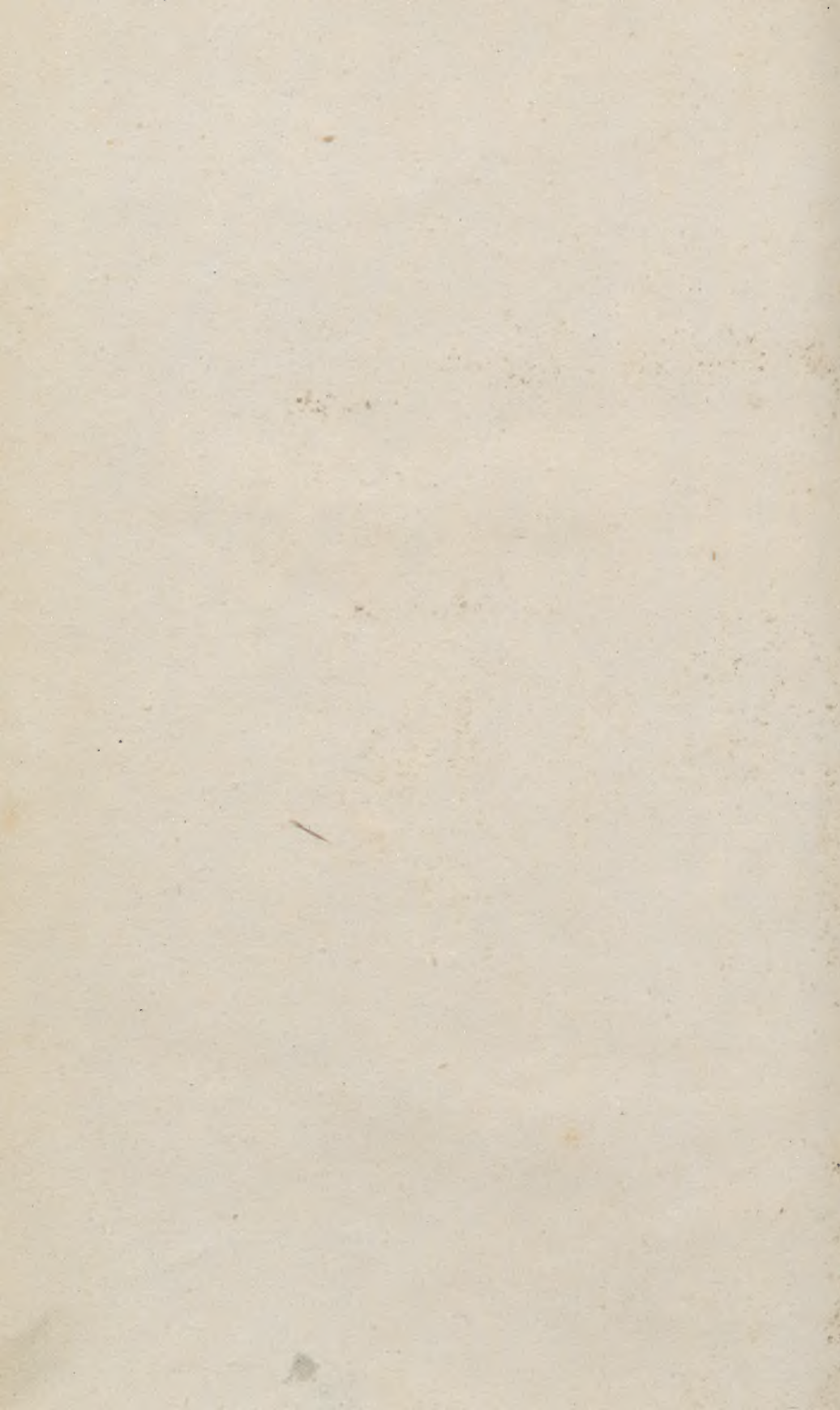




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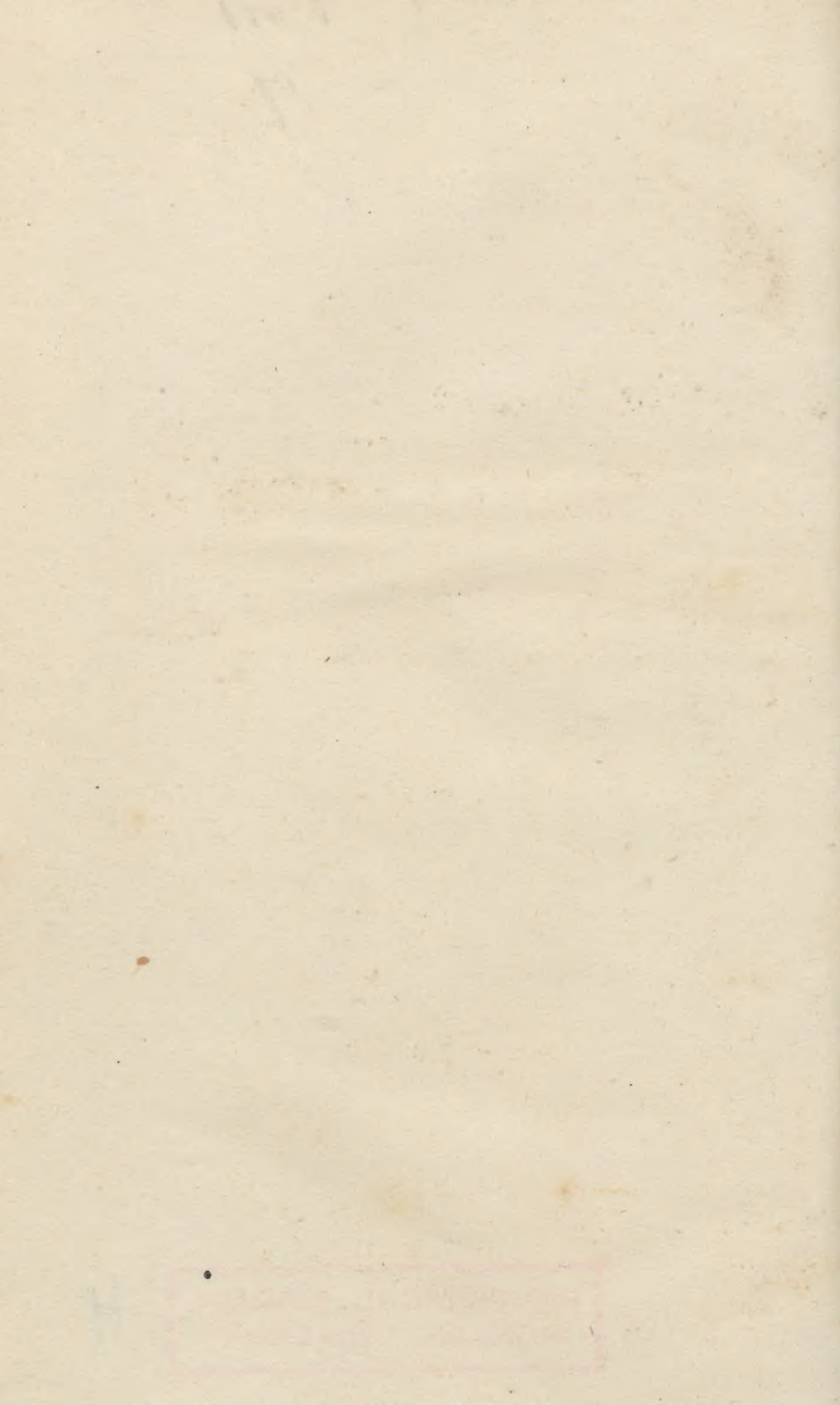
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nearly those of *Trichodesma*, but the fruit is rather that of the section *Heliophyllum* of *Heliotropium*. The species, though usually very different in aspect, are very difficult to characterize, as most of them appear connected by occasional intermediate specimens.

Leaves more or less toothed or rarely entire, flat concave or complicated.

Scabrous-pubescent or nearly glabrous shrubs or undershrubs.

Leaves entire or obtusely toothed. Corolla-lobes broad, usually obtuse.

Leaves mostly entire, obovate oblong or cuneate. Calyx-lobes obtuse

1. *H. solanacea*.

2. *H. littoralis*.

Leaves mostly obtusely toothed, at least at the end

3. *H. corymbosa*.

Undershrub. Stems erect, corymbose at the top, hispid as well as the foliage with long spreading hairs. Corolla-lobes acute .

4. *H. sericiflora*.

Undershrubs. Corolla-lobes rather acute. Inflorescence white, with appressed silky hairs

Glandular-glutinous, small branching shrubs, nearly glabrous or with a very short appressed pubescence.

Leaves mostly complicate, the margins undulate-plicate, with very prominent teeth

5. *H. Preissiana*.

6. *H. strigosa*.

Leaves narrow, mostly shortly 3-toothed at the end only . . .

Leaves quite entire, thick, convex or with recurved margins.

Leaves mostly obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Outer calyx-lobes broad.

Flowers in cymes

7. *H. lavandulacea*.

Leaves under $\frac{1}{2}$ in. long, few and distant. Flowers almost solitary.

Calyx-lobes linear

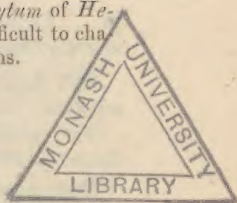
8. *H. integerrima*.

H. Lehmanniana, Sond. in Pl. Preiss. ii. 238, from York district, *Preiss*, n. 2336, is entirely unknown to me, but, from the character given, it would appear to be one of the numerous forms of *H. Preissiana*.

1. **H. solanacea**, *F. Muell. in Hook. Kew Journ.* ix. 21. An erect branching undershrub, the stems and foliage covered with a close pubescence, with more or less of longer appressed or loose hairs, almost silky on the inflorescence and calyx. Leaves obovate or cuneate-oblong, very obtuse, entire (or sparingly toothed?), flat, penniveined with the midrib prominent underneath, narrowed into a short petiole, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Cymes loose, with 1 or 2 leafy bracts at the base, or without any bracts. Calyx-segments lanceolate, obtuse, 3 to 4 lines long. Corolla-lobes shortly exceeding the calyx, apparently obtuse, but not seen perfect. Anthers pubescent. Fruit obtuse, 2 to $2\frac{1}{2}$ lines long.

N. Australia. Upper Victoria river and Sturt's Creek, *F. Mueller*; between the Bonney river and Mount Morphet, *M'Douall Stuart*.

2. **H. littoralis**, *Gaudich. in Freyc. Voy. Bot.* 449. t. 59. A shrub or undershrub, with ascending or erect rigid branching stems, more or less hirsute with short appressed and rigid or longer and loose hairs, or the foliage nearly glabrous. Leaves cuneate-oblong, obtuse, bordered especially at the end by a few coarse broad mostly obtuse teeth, entire and narrowed at the base, thick and firm, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Cymes without bracts, compact and corymbose when many-flowered, but often reduced to very few flowers, the inflorescence usually villous with rather long soft hairs. Calyx-segments linear or lanceolate, rather obtuse, varying at the time of flowering from scarcely 3 to above 4 lines in length, and sometimes still longer after flowering. Corolla-lobes broad, rather obtuse, spreading to a diameter of $\frac{3}{4}$ to $1\frac{1}{4}$



in. Anthers pubescent, the beak longer than the cells. Fruit oblong, shorter than the calyx, transversely rugose when dry.—DC. Prod. x. 177.

W. Australia. Sharks' Bay, *Gaudichaud*, *Denham*; Dirk Hartog's Island, *A. Cunningham*; Swan and Murchison rivers, *Drummond*, n. 52, 653, and 6th Coll. n. 132.

Var. *glabrifolia*. Leaves rather broad and quite glabrous.—*H. Bebrana*, F. Muell. Fragm. i. 209.—South Hutt river and Port Gregory, *Oldfield*.

Drummond, n. 122, appears to be a small-leaved form of the same species, which is a very variable one, and several of our specimens are very indifferent.

3. ***H. corymbosa***, *Lindl.* *Swan Riv. App.* 40. Erect and not much branched, apparently herbaceous but with a hard base, 1 to 1½ ft. high, hirsute all over with long spreading hairs. Leaves from linear-cuneate to oblong-lanceolate, coarsely and acutely toothed, contracted at the base. Cymes corymbose, with few elongated branches, sometimes almost reduced to simple 1-sided racemes. Calyx-segments linear, acute, 3 to 4 lines long. Corolla of a deep blue, as large as in *H. littoralis*, but the lobes much more acute. Fruit of *H. littoralis*, but the carpels appear sometimes to open longitudinally at the edge.

W. Australia. Swan River, *Drummond*, 1st Coll. n. 32.

4. ***H. sericiflora***, *Benth.* Apparently an undershrub, with ascending or diffuse branching stems, hirsute as well as the foliage with appressed or scarcely spreading hairs, the upper leaves as well as the inflorescence and calyx more or less densely silky with white hairs. Leaves narrow-oblong or linear, all but the uppermost bordered with a few distant teeth, not so acute as in *H. corymbosa*, mostly ½ to 1 in. long or rarely longer. Cymes often many-flowered. Calyx-lobes narrow and acute, and corolla of a deep blue with acute lobes as in *H. corymbosa*, but the flowers altogether usually smaller. Fruit not seen.

W. Australia. Murchison river, *Oldfield*.

5. ***H. Preissiana***, *Lehm. Pl. Preiss.* i. 347. An undershrub, with a thick woody stock and numerous slightly branched stems, or a more branching shrub, the stem and foliage sprinkled with short appressed rigid hairs, as in *H. strigosa*, but with less of the scabrous glandular indumentum. Leaves from obovate to oblong-cuneate, more or less conduplicate, the end and margins undulate, with very prominent and acute teeth, much contracted at the base or shortly petiolate, ½ to 1 in. long. Cymes loose and few-flowered. Flowers usually but not always larger than in *H. strigosa*, with the same acute calyx-segments and bright blue corolla.

N. S. Wales. Wellington Valley and Croker's Range, *A. Cunningham*; New England, *C. Stuart*; Clarence river, *Beckler*.

W. Australia. Port Gregory and S. Hutt river, *Oldfield*; Plantagenet and Stirling Ranges, *Maxwell*.

H. anagaloides, Endl. in Ann. Wien. Mus. ii. 204; *Lehm. Pl. Preiss.* i. 348, from the neighbourhood of King George's Sound, *Roe*, *Preiss*, which I have not seen, must be nearly allied to *H. Preissiana*, with the essential characters the same, but with the leaves only 1½ lines long, and the flowers very small.

6. ***H. strigosa***, *Schlecht. Linnæa*, xx. 614. An erect branching shrub,

the stems and foliage scabrous with a minute glandular tomentum, and more or less sprinkled or covered with short rigid appressed hairs. Leaves narrow-oblong or linear-cuneate, mostly 3-toothed at the end, and sometimes with 1 or 2 small teeth on each side lower down, the midrib very prominent underneath, otherwise flat, complicate or the margins very slightly recurved, rarely above $\frac{1}{2}$ in. long except in some very luxuriant Western specimens. Flowers smaller than in *H. corymbosa*, but with the same acute calyx-segments and deep blue corollas, the lobes often acute or shortly acuminate but sometimes quite obtuse. Fruit, where known, transversely rugose and rather acute.—*H. tuberculosa*, Schlecht. *Linnaea*, xx. 615; *H. cyanea*, Lindl. Swan Riv. App. 40.

Queensland. Armadillo, Barton.

N. S. Wales. Bogan river, Mitchell; Lachlan, Murray, and Darling rivers, Victorian and other Expeditions.

Victoria. Murray river, Dallachy.

S. Australia. Sand scrub, Behr; rocky ridges, Cudnaka, F. Mueller; Port Lincoln, Wilhelmi; Venus and Streaky Bays, Warburton; Lake Gillies, Burkitt; in the interior, M'Douall Stuart.

W. Australia. Drummond, n. 121, 402, 654; Oldfield river, S.W. Bay, Phillips and Gardner flats, Maxwell.

The eastern specimens have usually the calyx scarcely above 2 lines long, and the corolla also small; some of the western specimens have the flowers quite as small, in others they are considerably larger, but the plant has never the long spreading hairs of *H. corymbosa*, nor the dense silky hairs of *H. sericiflora*.

7. *H. lavandulacea*, Endl. in *Ann. Wien. Mus.* ii. 205. An erect branching shrub, attaining sometimes 2 ft. or more, the branches hoary with very short appressed rigid hairs, and often somewhat viscid. Leaves oblong or lanceolate, obtuse, rather thick, with recurved or revolute quite entire margins, rounded at the base and sometimes shortly petiolate, sprinkled above with very short appressed hairs, hoary or white and tomentose underneath, mostly $\frac{1}{2}$ to $\frac{3}{4}$ in. long or under $\frac{1}{2}$ in. on the smaller branches. Flowers not numerous, in short dense cymes interspersed with a few small leafy bracts. Calyx-segments very unequal, the outer ones broad, above 2 lines long, with recurved herbaceous tips, the inner ones shorter and linear. Corolla spreading to about $\frac{1}{2}$ in. diameter, the lobes rather obtuse. Anthers glabrous outside, the cells villous inside. Fruit obtuse, not seen ripe.—*H. andromedæfolia*, F. Muell. *Fragm.* i. 209.

N. S. Wales. Between the Murray and Darling rivers, F. Mueller.

W. Australia. Roe, Drummond, n. 336.

8. *H. integerrima*, Endl. in *Ann. Wien. Mus.* ii. 205. An erect, much-branched shrub, more slender than the other species, the branchlets white with a close tomentum, becoming sometimes nearly glabrous when old. Leaves small and scattered, linear or oblong, very obtuse, quite entire, convex, pubescent when young or at length glabrous above, more tomentose underneath, the margins thickened, mostly under $\frac{1}{4}$ in. long. Flowers few in the cymes and often solitary, the size of those of *H. strigosa*. Calyx-segments linear, minutely but rigidly glandular-pubescent. Anthers very slightly pubescent. Fruit shortly acuminate.

W. Australia. Roe, Drummond, 5th Coll. n. 96. Although I have not seen the

typical specimens of this and the preceding species, Endlicher's descriptions leave no doubt as to their identity.

7. TRICHODESMA, R. Br.

Calyx deeply divided into 5 segments. Corolla with a very short tube, almost rotate, with 5 acuminate lobes contorted in the bud. Stamens 5, inserted in the throat, the filaments very short and flat; anthers erect, linear, ciliate, cohering by the hairs in a cylinder contracted into a long spirally-twisted beak formed of the terminal appendages of the anthers. Ovary entire, 4-celled, with 1 pendulous ovule in each cell; style terminal, filiform, with a minute stigma. Fruit of 4 1-seeded nuts, attached by their whole inner face, which when detached leave 4 cavities in the thick persistent prominently 4-angled axis. Seeds without albumen; embryo straight, with a very short radicle.—Coarse hispid hoary or silky herbs. Leaves opposite or alternate, usually entire. Flowers in terminal one-sided simple or rarely forked racemes, usually accompanied by bracts.

The genus comprises very few species dispersed over the warmer regions of Asia and Africa. The only Australian species extends over nearly the whole range of the genus. Formerly included in the genus *Borago*, and still usually referred to the tribe of Boragaceæ, *Trichodesma* differs in the entire ovary with a terminal style, and is in fact very nearly allied to *Halgania*. The fruit, however, does not, as in that genus, separate into distinct carpels, but the endocarp, hardening round each seed, forms 4 pyrenes or nuts, which detach themselves from the persistent remainder of the pericarp.

1. ***T. zeylanicum*, R. Br. Prod. 496.** A coarse hard annual, usually erect, not much branched, and often attaining several feet, the indumentum very various, sometimes close and hoary or longer and silky, more frequently consisting of short rigid appressed hairs or long loose scattered ones, or the various hairs intermixed, the longer ones usually arising from prominent tubercles. Leaves in the Australian specimens mostly alternate or the lower ones opposite, more rarely nearly all (as is usually the case in Indian specimens) opposite, linear, linear-lanceolate or rarely broadly oblong-lanceolate, obtuse, often 3 to 4 in. long, the margins usually recurved. Flowers pale blue, in simple racemes, with a leafy bract under each always shorter than the pedicel. Calyx-segments lanceolate, acuminate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long at the time of flowering, narrow or broad, valvate or reduplicate, often cohering at the base, sometimes much enlarged round the fruit, but without the reflexed auricles of *T. indicum*. Corolla-lobes broad, longer than the calyx, the points narrow, spirally-twisted in the bud as well as the long anther-points. Nuts smooth and shining.—A. DC. Prod. x. 172, with the synonyms added; Bot. Mag. t. 4820.

N. Australia. N.W. coast, *A. Cunningham* and others; Victoria river, *F. Mueller* islands of the Gulf of Carpentaria and adjoining mainland, *R. Brown* and others.

Queensland. Keppel and Shoalwater Bays, *R. Brown*; common from Cape York to Moreton Bay and in the interior, *A. Cunningham*, *F. Mueller*, and many others.

N. S. Wales. Between Stokes' Range and Cooper's Creek, *Wheeler*.

S. Australia. Head of Spencer's Gulf, *R. Brown*; Elder's and Flinders' Ranges, *F. Mueller*; Cooper's Creek, *Howitt's Expedition*; Mount Searle, *Warburton*.

W. Australia. Sharks' Bay, *Milne*; Murchison river, *Oldfield*, *Drummond*, 6th Coll. n. 133; Flinders' Bay, *Collie*.

Var. *latispalum*, F. Muell. Calyx-segments short and broad, almost cordate but not auriculate.—Hooker's and Sturt's Creeks and Blackin River, F. Mueller.

Var. *sericeum*. Stem and foliage very hoary with a close soft tomentum.—*T. sericeum*, Lindl. in Mitch. Trop. Austr. 258. Victoria river, F. Mueller; Belyando river, Mitchell.

The species is common in the E. Indian peninsula, in Ceylon, and in tropical Africa.

TRIBE II. BORAGINÆÆ.—Ovary 4- or 2-lobed, the style inserted between the lobes and more or less lateral or basal with reference to the carpels. Herbs or very rarely, in species not Australian, shrubs. Fruit separable into 4 or 2 small nuts, leaving a persistent flat convex conical or rarely elongated receptacle or axis.

8. MYOSOTIS, Linn.

(Exarrhena, R. Br.)

Calyx deeply divided into 5 segments or, in species not Australian, 5-toothed. Corolla with a cylindrical tube, with 5 small scales in the throat, the limb spreading, 5-lobed. Stamens inserted in the tube; anthers included or exserted. Ovary 4-lobed; style filiform, inserted between the lobes; stigma small, usually capitate. Nuts 4, smooth and shining, erect, attached by a small basal area. Seeds without albumen; radicle short.—Herbs usually hispid. Leaves entire. Flowers blue or white, in simple or forked one-sided spikes or racemes, without bracts.

The genus is chiefly abundant in the temperate regions of the northern hemisphere, especially in the Old World, more rare in North America, tropical Asia, and in the extratropical regions of the southern hemisphere. Of the two Australian species, one extends to New Zealand, the other is endemic.

Corolla-lobes shorter than the tube. Anthers included or the tips scarcely protruding. (Flowers very small) 1. *M. australis*.
Corolla-lobes as long as the tube. Anthers wholly exserted 2. *M. swarzenskii*.

1. *M. australis*, R. Br. Prod. 495. An erect or diffuse hispid annual (or perennial?), the stems usually branching from the base, sometimes slender and under 6 in. high, sometimes long and weak, extending to 1 or 2 ft. Lower leaves on long petioles, from obovate-oblong to oblanceolate or linear-spathulate, the stem ones more sessile and smaller, the uppermost sometimes very small sessile and cordate-ovate. Flowers small, white or yellowish (or rarely blue?), in scorpioid spikes at first dense but at length often long and interrupted. Calyx-segments narrow-lanceolate, hispid with hooked hairs, $\frac{3}{4}$ to $1\frac{1}{4}$ line long. Corolla-tube rather longer than the calyx, the scales of the throat obtuse and notched, the lobes short, broad, obtuse or retuse. Anthers and style included in the tube or the tips slightly protruding. Nuts shorter than the calyx.—DC. Prod. x. 110; Hook. f. Fl. Tasm. i. 279; *M. staminea*, Lehm. Pl. Preiss. i. 348.

N. S. Wales. Paterson's River, R. Brown; Blue Mountains, A. and R. Cunningham and many others; Illawarra, A. Cunningham; Nanges, McArthur.

Victoria. Wenda Vale, Robertson; common in the Australian Alps, ascending to 4000 to 5000 ft., F. Mueller.

Tasmania. Port Dalrymple and Derwent river, R. Brown; common everywhere, ascending to 4000 ft., J. D. Hooker.

S. Australia. Guichen Bay, Lofly Range, F. Mueller.

W. Australia. *Diamond*, n. 196, 217; Rottenest Island, *Preiss*, n. 1934; Mount Manypeak river, *Maxwell*; Perongerup Range, *F. Mueller*.

The species is also in New Zealand.

2. ***M. suaveolens*, Poir. Dict. Suppl. iv. 14.** An erect but sometimes weak perennial, forming a thick hard stock, the stems simple or branched, 1 to 2 ft. high, the hairs long and spreading on the stem and often on the margins and midribs of the leaves, appressed on their surface. Leaves oblong linear or lanceolate, mostly acute, sessile and broad at the base or contracted into a short petiole, often decurrent, the lower ones sometimes 3 or 4 in. long, the upper ones small. Flowers white or bluish, in simple or branched racemes, at first dense, at length several inches long, the pedicels short. Calyx-segments narrow, 3-nerved, usually about 2 lines long but variable, hispid with hooked hairs. Corolla-tube as long as the calyx; scales of the throat short and broad; lobes broad, as long as the tube. Stamens inserted in the throat; filaments filiform; anthers narrow-oblong, wholly exserted as well as the style. Nuts shorter than the calyx.—DC. Prod. x. 111; Hook. f. Fl. Tasm. i. 279; *Exarrhena suaveolens*, R. Br. Prod. 495; A. Rich. Sert. Astrol. t. 29.

N. S. Wales. Frequent on rocky margins of creeks in the Blue Mountains, *A. Cunningham*.

Victoria. Frequent in the Australian Alps, *F. Mueller*; Ballarat, *Glendinning*.

Tasmania. Port Dalrymple, *R. Brown*; abundant in light rich soil, ascending to 2000 ft., *J. D. Hooker*.

9. **ERITRICHIUM**, Schrad.

Calyx deeply divided into 5 segments. Corolla with a cylindrical tube, the throat with 5 minute gibbosities or scales or quite naked, the limb spreading, 5-lobed. Stamens inserted in the tube, the anthers included. Ovary 4-lobed; style filiform, inserted between the lobes, with a small usually capitate stigma. Nuts 4, rugose or reticulate, erect, attached to the shortly pyramidal or convex receptacle by an oblique arcle, the inner angle prominent. Seeds without albumen; radicle short.—Herbs with the habit foliage and flowers nearly of *Myosotis*, but the inflorescence usually with bracts.

There is a considerable number of species dispersed over the temperate and mountainous regions of Europe and Asia, and in America descending from the United States along the line of the Andes to Chile. The only Australian one is endemic. The genus is closely allied to *Myosotis* and *Echinosperrum*, having the same habit and flowers, with the fruit intermediate, as it were, between the two, the receptacle more prominent than in *Myosotis*, much less so than in *Echinosperrum*, the nuts neither smooth and shining as in the former nor muricate as in the latter.

1. ***E. australasicum*, A. DC. Prod. x. 134.** Stems usually numerous, tufted diffuse or ascending, rarely nearly simple and erect, mostly under 6 in. long, the whole plant hispid, the hairs often yellowish on the young shoots. Leaves linear, obtuse, the lower ones sometimes almost opposite, rarely exceeding $\frac{1}{2}$ in., the upper ones smaller. Flowers very small (white?), nearly sessile in the axils of the bracts, forming simple one-sided leafy spikes. Calyx-segments very hispid, linear, scarcely 1 line long. Corolla scarcely exceeding the calyx, the lobes shorter than the tube. Anthers small. Style



short. Nuts shorter than the calyx, rugose, with much-raised reticulations.—*Heliotropium elachanthum*, F. Muell. in *Linnaea*, xxv. 424.

Victoria. Wimmera, *Dallachy*; Skipton, *Whata* (the latter specimens very young and somewhat doubtful).

S. Australia. Pastures, Rocky Creek, *F. Mueller*.

W. Australia. *Drummond*, n. 505.

10. ECHINOSPERMUM, Swartz.

Calyx deeply divided into 5 segments. Corolla with a cylindrical tube, the throat with 5 small scales inside; lobes 5, spreading. Stamens inserted in the tube; anthers included. Ovary 4-lobed; style inserted between the lobes, with a small usually capitate stigma. Nuts 4, usually more or less mucronate with hooked prickles, erect, laterally attached to a narrow-conical receptacle. Seeds without albumen, radicle short.—Herbs with the habit foliage and flowers of *Myosotis*, but the flowers usually interspersed with bracts.

A considerable genus dispersed over the temperate and mountainous regions of Europe and Asia, but scarcely tropical. The only Australian species appears to be endemic.

1. **E. concavum**, *F. Muell. Pragn.* ii. 139; vi. 116. An annual, strigose or hoary with appressed hairs, looser on the main stems: stems either erect nearly simple and under 6 in. high or longer, diffuse and almost woody at the base. Leaves linear or oblanceolate, the larger ones above 1 in. long, the upper ones passing into the small floral leaves or bracts. Flowers in one-sided leafy racemes, the pedicels at first very short, but lengthening to $\frac{1}{4}$ in. or more when in fruit. Calyx-segments about $\frac{3}{4}$ line long, lanceolate, enlarging after flowering. Corolla about 1 line long, the tube with a ring of obtuse scales inside above the anthers, the lobes obovate-oblong, much shorter than the tube. Nuts about 2 lines long, very concave on the back, with thick raised almost involute margins bordered by stout conical glochidiate prickles, the enclosed area tuberculate.

N. S. Wales. Darling river, *Victorian Expedition*; between Stokes' Range and Cooper's Creek, *Wheeler*.

Victoria. Wimmera, *Dallachy*.

S. Australia. Near Gawler Town, *F. Mueller*.

W. Australia. *Drummond*, n. 165.

11. ROCHELIA, Reichenb.

(*Maccoya*, *F. Muell.*)

Calyx deeply divided into 5 or more segments. Corolla with a cylindrical sometimes incurved tube, the throat with or without scales inside; limb spreading, 5-lobed or rarely 4- or 6-lobed. Stamens 5 or rarely fewer, included in the tube. Ovary 2-lobed, 2-celled, with 1 ovule in each cell; style inserted between the lobes, with a small usually capitate stigma. Nuts 2, erect, rugose, laterally attached to the narrow-conical receptacle. Seeds without albumen; radicle short.—Herbs with the habit of *Myosotis*, the inflorescence usually interspersed with bracts, the fruiting-calyx often more or less hardened at the base round the nuts.

The genus comprises very few species from the Mediterranean region of the northern

hemisphere and from western Asia. The only Australian species is endemic, but is very nearly allied to one of the east Mediterranean ones. The genus is usually allied to *Echinopspermum*, but has only 1 cell and ovule to each carpel.

1. **R. Maccoya**, *F. Muell. ms.* A hispid annual with several procumbent or ascending stems, a few inches in length. Leaves linear, the radical ones 1 in. long or even more, those of the stem few and small. Flowers on very short pedicels, usually below the floral leaves or bracts, the upper ones forming an irregular one-sided leafy raceme. Calyx about 2 lines long, oblique, incurved, divided into from 7 to 9 rather unequal linear-segments. Corolla shorter than the calyx, with 4 to 6 very short obtuse lobes, without scales in the throat. Stamens usually 4. Nuts enclosed in the hardened base of the calyx-segments. *Maccoya pharispala*, *F. Muell. Fragm. i. 127.*

N. S. Wales. Murray Desert towards the Darling river, *F. Mueller*. In the few flowers I opened, I found 7 calyx-segments and only 4 stamens, the corolla-lobes sometimes 5, sometimes 6; *F. Mueller* has observed as many as 9 calyx-segments. The species is nearly allied to *R. caucellata*, Boiss., which has a similar multiplication of calyx-segments but with the normal number of 5 corolla-lobes and stamens.

12. CYNOGLOSSUM, Linn.

(*Omphalodes*, *Moench*.)

Calyx deeply divided into 5 segments. Corolla with a short broad tube, the throat closed with scales opposite the lobes, the limb spreading, almost rotate, 5-lobed. Anthers enclosed in the tube. Ovary 4-lobed; style shortly filiform, inserted between the lobes, with a small usually capitate stigma. Nuts 4, depressed, attached by the inner end of the under surface or by the inner edge to the convex or hemispherical receptacle, the upper surface usually more or less covered with short hooked prickles or bordered by a raised often toothed margin. Seeds without albumen; radicle short. Herbs clothed with stiff hairs, either appressed and hoary or spreading, sometimes reduced to scattered tubercles. Leaves entire. Flowers blue purplish or rarely white, in one-sided simple or forked racemes, with or without bracts.

The genus is widely dispersed over the temperate and warmer regions of the Old World. The Australian species appear to be all endemic.

Diffuse or straggling. Leaves ovate, petiolate. Floral leaves or bracts at or near all the pedicels 1. *C. latifolium*.
Erect. Leaves lanceolate or oblong.

Nuts glochidiate all over.

Pedicels longer than the calyx, with bracts at or near them all,
or at least the lower ones 2. *C. suaveolens*.
Pedicels shorter than calyx. Bracts none 3. *C. australe*.

Nuts glochidiate only on the raised margin or rarely along a central raised ridge. Bracts none 4. *C. Drummondii*.

1. **C. latifolium**, *R. Br. Prod. 495.* A perennial, with diffuse or straggling branching stems, extending sometimes to several feet, scabrous with scattered tubercles, which rarely lengthen into short hairs or prickles. Leaves petiolate, ovate, acute, quintuplinerved, the lower ones often at least 2 in. long, the upper ones gradually smaller and more sessile, ultimately reduced to small bracts. Flowers small, on slender recurved pedicels, usually

by the side of or rather below the floral leaves or bracts. Calyx-segments rather broad, obtuse or shortly acuminate, about 1 line long but somewhat enlarged after flowering. Nuts obovate, spreading, convex, glochidiate all over, attached by the inner end of the under surface.—DC. Prod. x. 156; Hook. f. Fl. Tasm. i. 280.

N. S. Wales. Paterson's River, *R. Brown*; Bent's Basin, *Woolfs*; New England *C. Stuart*; Clarence river, *Beckler*.

Victoria. Shady places, Dandenong Mountains and Latrobe river, *P. Mueller*; Warran river, *Robertson*.

Tasmania. Very damp shady situations, Circular Head, *Gunn*.

2. **C. suaveolens**, *R. Br. Prod.* 495. An erect stout coarsely-hirsute plant with a perennial stock, the stems slightly branched, 1 to 2 ft. high. Radical and lower leaves on long petioles, lanceolate or oblong, sometimes several inches long; stem-leaves few, on shorter petioles, the upper ones small, sessile, lanceolate. Racemes loose, more or less forked, with small leafy bracts below most of the pedicels. Pedicels longer than the calyx and sometimes $\frac{1}{2}$ in. long, recurved after flowering. Calyx segments very open, narrow, $1\frac{1}{2}$ lines long. Nuts ovoid, spreading, flat or slightly convex, densely glochidiate outside, obliquely attached by their inner smooth face to the broad very prominent almost hemispherical receptacle. Seed flat or slightly concave. Embryo concave.—DC. Prod. x. 156; Hook. f. Fl. Tasm. ii. 368.

N. S. Wales. Port Jackson, *R. Brown*; between the Upper Bogan and Lachlan rivers, *L. Morton*; Wellington Valley, *A. Cunningham*.

Victoria. Port Phillip, *R. Brown*; common about Melbourne, *P. Mueller* and others; Skipton, *W. L. W.*; Wimmera, *Dellachy*; north of the Glenelg, *Mitt.*

Tasmania. Port Dalrymple, *R. Brown*; common in dry soil, *J. D. Hooker*.

3. **C. australe**, *R. Br. Prod.* 495. An erect stout hispid perennial, usually taller than *C. suaveolens*, and the hairs of the lower part of the stem long and reflexed. Radical and lower leaves on long petioles, the upper ones nearly sessile, all lanceolate or the lower ones oblong, often several inches long. Flowers sweet-scented, light blue or white, in long slender more or less forked racemes, without bracts, the pedicels rarely exceeding the calyx and mostly shorter. Calyx-segments shortly hispid, obtuse, about 1 line long. Nuts very spreading, depressed, obovate, either nearly flat or with a more or less raised and glochidiate margin, the whole surface also more or less glochidiate, attached to the convex or almost hemispherical receptacle by a small smooth portion at the inner end of their under surface. Seeds flat.—DC. Prod. x. 151; Hook. f. Fl. Tasm. ii. 368.

N. S. Wales. Hastings, Clarence, and Macleay rivers, *Beckler*; Richmond river, *Fawcett*; Paramatta and Mudgee, *Woolfs*; Illawarra, *A. Cunningham*.

Victoria. Port Phillip, *R. Brown*; Forest Creek, Snowy River, Darguin Creek, etc., *P. Mueller*; Wendu Vale, *Robertson*.

Tasmania. Port Dalrymple, *R. Brown*; common in dry soil, *J. D. Hooker*.

The fruit of this species sometimes almost passes into that of the genus or section *Omphalodes*, although always glochidiate.

4. **C. Drummondii**, *Benth.* A tall erect hispid perennial like *C.*

australe, and perhaps a variety, but with the peculiar fruit of the genus or section *Omphalodes*. Hairs of the plant usually longer and looser than in *C. australe*, the pedicels often rather longer and occasionally a few bracts developed at the base of the raceme, the foliage, inflorescence, and flowers otherwise the same. Nuts depressed, spreading, almost orbicular, with a much-raised membranous shortly fringed border, the enclosed upper concave surface quite smooth or rarely with a slightly raised midrib bearing a few hooked prickles, the under surface convex and quite smooth, the attachment as in *C. australe*.

S. Australia. Mount Remarkable, *F. Mueller*; Mount Searle, *Warburton* (with large flowers).

W. Australia, *Drummond*, n. 504 (with small flowers).

ORDER LXXXI. CONVULVACEÆ.

Flowers regular. Calyx free, persistent, of 5 distinct much imbricated sepals, rarely united in a 5-toothed or 5-lobed calyx. Corolla campanulate or funnel-shaped or rarely rotate or with a cylindrical-tube, the limb usually spreading, 5-angled or 5-lobed, folded in the bud or very rarely imbricate. Stamens 5, inserted in the tube, alternate with the lobes or angles of the corolla, often of unequal length; anthers versatile or almost erect, with 2 parallel cells opening by longitudinal slits. Ovary free, 2-, 3- or 4-celled, rarely divided into 2 or 4 distinct carpels, with 1 or 2 erect or ascending ovules in each cell or carpel or 1-celled with 2 or 4 ovules; style single or more or less divided into 2 entire or 2-fid branches or styles. Fruit either a capsule opening in 2, 3, or 4 or twice as many valves, leaving the dissepiments attached to the axis, or opening transversely, or bursting irregularly, or succulent and indehiscent. Seeds with a small quantity of mucilaginous albumen or without any; cotyledons usually very much folded, rarely straight or imperceptible.—Herbs often twining or rarely shrubs, woody twiners or even trees, or (in *Cuscuta*) leafless, twining parasites. Leaves alternate. Inflorescence various, usually axillary and more or less cymose or peduncles 1-flowered. Bracts and bracteoles usually small or deciduous, rarely large and persistent. Flowers often large and showy, rarely very small.

A considerable Order, widely spread over almost every part of the globe, but most abundant in warm countries. Of the eleven Australian genera, seven are diffused over the whole area of the Order or at least over the warmer regions of both the New and the Old World, two extend over tropical Asia, and the remaining two appear to be endemic. A large proportion of the species also have a very wide geographical range.

Leafy plants (climbing prostrate or erect). Sepals distinct.

Stigma sessile. Corolla-limb of 5 deeply 2-lobed divisions. Tall woody climbers. Flowers small. 1. ERYCIBE.

Style filiform, undivided to the stigma or stigmatic lobes. Corolla-limb 5-angled or 5-lobed.

Stigma or stigmatic lobes globular or nearly so.

Fruiting sepals scarcely altered, or if enlarged, closing over the capsule 2. IFOMEA.

Fruiting sepals much enlarged, very spreading, thin and veined 5. PORANA.

Stigmatic lobes linear oblong or rarely ovate.
Stigmatic lobes 2. Ovary completely or imperfectly 2-celled,
with 2 ovules to each cell 3. CONVULVULUS.

- Stigmatic lobes 4 to 8 or rarely 2. Ovary 2-celled, with 1 ovule in each cell 4. POLYMERIA.
- Style more or less branched below the stigmas or divided to the base.
- Style-branches 2, with globular stigmas.
- Corolla-limb 5-angled or shortly 5-lobed, folded in the bud. Flowers axillary 6. BREWERIA.
- Corolla-limb of 5 divisions, imbricate in the bud. Flowers in terminal heads or spikes 7. CRESSA.
- (The Asiatic *Poranas* have also sometimes a branched style.)
- Style-branches 4, with linear stigmas 8. EVOLVULUS.
- Ovary itself divided into 2 carpels, each with a basal style and containing 1 or 2 ovules 9. DICHONDRA.
- Leafy plants (low and diffuse). Calyx 5-toothed. Style branched, with globular stigmas 10. WILSONIA.
- Leafless parasites with filiform stems. Style branched or divided to the base 11. CUSCUT.

1. ERYCIBE, Roxb.

Corolla with a short tube, the limb spreading, of 5 deeply 2-lobed divisions, the lobes in the bud closely folded over each other, the divisions themselves contorted-imbricate. Ovary 1-celled, with 4 erect ovules; stigma sessile, large and thick, divisible into 2, but marked outside with 5 or 10 angles or furrows (the result of the impression of the folds of the corolla or of the stamens in the bud). Fruit an indehiscent berry, containing usually a single seed.—Tall woody evergreen climbers. Leaves entire. Flowers small, in short dense racemes, cymes or clusters, either all axillary or the upper ones in a terminal leafless panicle.

The genus consists of very few species, very nearly allied to each other, spread over tropical Asia. The only Australian one appears to be the one most common in East India and the Archipelago.

1. *E. paniculata*, Roxb.; *Pl. Corom.* ii. 31. t. 159. A very tall woody climber, the young branches under side of the young leaves and inflorescence more or less rusty-tomentose or villous, the adult foliage glabrous or nearly so. Leaves shortly petiolate, oval-elliptical, more or less acuminate, entire, coriaceous, mostly 3 to 4 in. long. Flowers yellow, in short dense racemes or compact panicles, the lower ones often axillary and much shorter than the leaves, the upper ones forming, in the few Australian specimens seen, a small narrow, terminal panicle, which, in the Indian ones, is usually large and much branched. Sepals orbicular, a little more than 1 line long, hairy outside. Corolla-tube scarcely so long as the sepals; limb spreading to 3 or 4 lines diameter, pubescent outside, the divisions deeply and broadly 2-lobed. Filaments attached to the base of the tube; anthers ovoid, acuminate, with rather long points. Berry in the Indian specimens ovoid, above $\frac{1}{2}$ in. long, not seen in the Australian ones.—DC. Prod. ix. 464; Wight, Illustr. t. 180 (the stigma incorrectly drawn).

Queensland. Rockingham Bay, *Dallachy*. Widely spread over E. India and the Archipelago, and including probably some other described species, the differential characters in the whole genus being as yet very vague and uncertain.

2. IPOMŒA, Linn.

(Pharbitis, Batatas, Calonyction, Quamoclit, Aniscia, and Skinneria, Chois.)

Corolla campanulate or with a cylindrical tube; the limb spreading, entire, angular or rarely deeply lobed, folded in the bud. Ovary 2- or 3-celled, with 2 ovules in each cell, or more or less perfectly 4-celled by the addition of a spurious dissepiment between the ovules. Style filiform; stigma capitate, entire, or with 2 short globular or rarely almost ovate lobes. Fruit a dry capsule.—Twining prostrate creeping or rarely low and erect herbs or woody climbers. Leaves entire lobed or divided into distinct segments or leaflets. Flowers often large and showy, axillary, solitary or in dichotomous cymes or rarely in irregular racemes.

A large genus, dispersed over all warm climates, very few species being found without the tropics, either in the New or the Old World. Of the thirty-eight Australian species here enumerated, six or perhaps seven are dispersed over the tropical regions of the New as well as the Old World, five or perhaps six spread over Africa as well as Asia, six appear to be limited to tropical Asia, two extend from the Mascarene to the Pacific Islands, one only extends to the Pacific Islands, two are probably introduced only in Australia, and the remaining fourteen, fifteen, or sixteen, are, as far as hitherto known, endemic in Australia.

The distribution of the numerous species into distinct genera has been frequently attempted, but has been practically unsuccessful. The separation of the species with a hypocrateriform corolla and exserted stamens is perhaps the most definite, but a very unnatural one, as it would associate *I. Bona-nox* with *I. Quamoclit*. *Pharbitis* with a 3-merous pistil, is quite as artificial, as it would include *I. dissecta* with *I. hederacea* and its allies besides that the character is sometimes inconstant in the same species. The spurious dissepiments of *Batatas* are often very imperfect or disappear altogether. The ovary of *Skinneria* is not 1-locular, as had been supposed, although the dissepiment dries up as the fruit enlarges. The inequality of the sepals in some species of *Aniscia* is not greater than in several species retained in *Ipomœa*. The spiral twisting of the anthers after emitting their pollen, so characteristic of some of the large-calyxed species is but slight or uncertain in others. And notwithstanding great differences in the form of the corolla, in the dehiscence of the capsule, and indumentum of the seeds, no good natural groups founded upon any of these characters have as yet been proposed. As a whole, the genus *Ipomœa* itself can scarcely be said to be a very well marked nor a very natural one; it is distinguished from *Argyrea* by the dry capsular fruit usually, but not always, opening in valves, and from *Convolvulus* only by the globular or orbicular stigma or stigmatic lobes. The series of species here proposed are too artificial, and not always sufficiently distinct, to be given as sections, but they are the best I have been able to frame for the determination of the Australian species.

SERIES I. Digitata. *Leaves digitately divided into deep lobes or distinct segments or leaflets. Flowers of the Speciosæ, or rarely of the Campanulata.*

- | | |
|--|-----------------------------|
| Leaves palmately or almost pedately several-lobed. Flowers large in loose cymes | 1. <i>I. paniculata</i> . |
| Leaves divided into 3 (or 5?) distinct obovate lobed segments. Flowers rather large. Plant stellate-tomentose | 2. <i>I. Davenporti</i> . |
| Leaves divided into 5 or 7 ovate or lanceolate entire segments. Flowers large. Plant glabrous or hairy. Sepals nearly equal. Seeds pubescent or hairy. Leaf-segments usually confluent at the base | 3. <i>I. palmata</i> . |
| Inner sepals nearly twice as large as the outer ones. Seeds glabrous. Leaf-segments quite distinct. | 4. <i>I. quinata</i> . |
| Leaves divided into 3 to 7 linear usually pinnatifid segments. Corolla nearly 2 in. long. (Ovary 2-celled?) | 5. <i>I. diversifolia</i> . |
| Corolla scarcely $\frac{1}{2}$ in. long. Ovary 3-celled | 6. <i>I. dissecta</i> . |





SERIES II. **Pharbitides**.—*Leaves entire or 3-lobed. Ovary usually 3-celled. Sepals usually long and narrow. Corolla of the Speciosæ.*

Calyx acuminate, above $\frac{1}{2}$ in. long.

Leaves mostly 3-lobed. Flowers few on the peduncle. Calyx hairs usually spreading 7. *I. hederacea*.

Leaves mostly entire. Flowers usually several in a compact cyme. Hairs usually appressed 8. *I. congesta*.

Calyx scarcely acuminate, under $\frac{1}{2}$ in. long. Leaves mostly entire 9. *I. purpurea*.

SERIES III. **Calycinæ**.—*Leaves entire or lobed at the base. Ovary 2-celled. Sepals large, obtuse (attaining $\frac{3}{4}$ to 1 in. after flowering). Corolla large ($1\frac{1}{2}$ to 3 in. long).*

Glabrous or nearly so. Bracteoles small. Sepals very large. Corolla broadly campanulate, about 2 in. long.

Leaves large, mostly peltate 10. *I. peltata*.

Leaves cordate or hastate, acuminate. Petioles and peduncles often winged 11. *I. alata*.

Pubescent. Bracteoles large, membranous, deciduous. Corolla campanulate, $1\frac{1}{2}$ in. long or rather more 12. *I. Turpetum*.

Glabrous or sparingly pubescent. Bracteoles small. Corolla about 3 in. long, contracted into a tube at the base.

Leaves acuminate. Outer sepals rather larger than the others 13. *I. longiflora*.

Leaves very obtuse, almost reniform. Outer sepals rather smaller than the others 14. *I. costata*.

SERIES IV. **Speciosæ**.—*Leaves entire toothed or lobed at the base. Ovary 2-celled or speciosely 4-celled. Sepals moderate or small (rarely attaining $\frac{1}{2}$ in.). Corolla large ($1\frac{1}{2}$ to 3 in. long), often more or less tubular at the base, usually pink purple or white.*

Stems prostrate or creeping and rooting at the lower nodes. Maritime plants. Seeds woolly-hairy.

Leaves rather thick, very obtuse or emarginate. Ovary more or less 4-celled.

Leaves broad, 2 to 3 in. long, the veins prominent 15. *I. Pes-capræ*.

Leaves small or narrow, the veins scarcely prominent 16. *I. carnosa*.

Leaves rather thin. Ovary 2-celled.

Leaves acute or acuminate. Seeds woolly-hairy 17. *I. reptans*.

Leaves obtuse or acute. Seeds glabrous 21. *I. denticulata*.

Stems twining (sometimes creeping in *I. denticulata*).

Corolla $2\frac{1}{2}$ to above 3 in. long.

Leaves linear-lanceolate, not cordate. Stems slender 18. *I. graminea*.

Leaves broadly ovate-cordate. Stems woody at the base.

Pubescent or villous 19. *I. velutina*.

Glabrous 20. *I. abrupta*.

Corolla $1\frac{1}{2}$ to 2 in. long or scarcely more. Leaves cordate or hastate.

Peduncles usually much shorter than the rather long pedicels.

Sepals obtuse or mucronate. Leaves mostly obtusely auricu-

late 21. *I. denticulata*.

Sepals acuminate. Leaves mostly hastate 22. *I. gracilis*.

Peduncles mostly longer than the short pedicels. Leaves cordate.

Corolla above $1\frac{1}{2}$ in. long. Seeds glabrous 23. *I. sepriaria*.

Corolla scarcely $1\frac{1}{2}$ in. long. Seeds villous 24. *I. Muelleri*.

SERIES V. **Campanulatæ**.—*Leaves entire toothed or lobed at the base. Ovary 2-celled. Corolla moderate or small (rarely exceeding 1 in.), usually broadly campanulate, yellow white or pink.*

Stems twining. Flowers several together in pedunculate cymes or racemes, the pedicels usually short.

Leaves cordate-ovate or lanceolate. Cymes many-flowered.

Sepals obtuse, coriaceous. Corolla 1 in. long, white. Capsule acuminate 25. *I. cymosa*.

Leaves narrow, not cordate. Racemes or cymes loose, few-flowered. Sepals acute. Corolla small, yellow. Capsule 1-celled 26. *I. linifolia*.

Leaves cordate. Cymes dense or few-flowered. Sepals obtuse. Corolla yellow. Capsule globular, at length rugose.

Sepals squarrose. Corolla small. Seeds pubescent 27. *I. chryseides*.

Sepals not squarrose. Corolla nearly 1 in. long. Seeds glabrous 28. *I. flava*.

Stems twining. Flowers solitary or rarely 2 or 3 together, the peduncles and pedicels mostly longer than the calyx.

Leaves petiolate.

Leaves cordate-ovate, entire. Sepals small, obtuse 29. *I. obscura*.

Leaves ovate-lanceolate, deeply toothed or lobed below the middle. Sepals narrow, acute 30. *I. incisa*.

Leaves oblong or linear, not cordate, entire. Sepals large, acute, the outer ones broad and decurrent 31. *I. uniflora*.

Leaves sessile, narrow, toothed at the base or hastate 32. *I. angustifolia*.

Stems twining. Flowers small, solitary or several together, sessile or with very short peduncles and pedicels. Leaves from cordate to lanceolate.

Pedicels mostly about as long as the calyx. Capsule glabrous . 33. *I. plebeia*.

Flowers nearly sessile. Capsule pubescent or villous 34. *I. eriocarpa*.

Stems erect or ascending, not twining. Leaves not cordate, usually narrow. Flowers small.

Plant hairy. Leaves entire toothed or lobed. Flowers nearly sessile 35. *I. heterophylla*.

Plant tomentose or densely villous. Leaves entire. Flowers solitary or in small cymes on a more or less elongated peduncle 36. *I. erecta*.

SERIES VI. **Urceolatae**.—*Leaves entire. Ovary 2-celled. Corolla small, urceolate, the tube broad, contracted at the throat.*

Stems twining, villous. Leaves cordate. Flowers in dense almost sessile cymes 37. *I. urceolata*.

SERIES VII. **Hypocrateriformes**.—*Leaves entire or pinnatifid. Ovary 2-celled or spuriously 4-celled. Corolla with a cylindrical narrow tube, and spreading nearly flat limb.*

Stems twining. Leaves pinnatifid, with linear-subulate lobes.

Flowers red. Ovary 4-celled 38. *I. Quamoclit*.

SERIES I. **DIGITATÆ**. Leaves digitately divided into deep lobes or distinct segments or leaflets. Flowers large or small, campanulate or tubular at the base.

1. ***I. paniculata***, *R. Br. Prod.* 486. Stems trailing or twining sometimes to a great length, the whole plant glabrous. Leaves palmately or almost pedately divided to below the middle into 5 to 9 ovate-lanceolate obtuse or acuminate lobes, the whole leaf often 6 to 8 in. long and broad. Peduncles longer than the petiole and sometimes 8 to 10 in. long, bearing a cyme of several large purple or pink flowers. Sepals broad, very obtuse, 3 to 4 lines long. Corolla campanulate, shortly tubular at the base, 2 in. long

or more. Anthers large, unilobate but scarcely twisted. Ovary 2-celled or more or less 4-celled by spurious dissepiments between the seeds especially at the top. Capsule $\frac{1}{2}$ in. diameter or even larger. Seeds densely woolly, villous. Bot. Reg. t. 62; *Bulnesia pumila* Choisy, Choisy, Or. and in DC. Prodr. ix. 339; *I. insignis*, Andr. Bot. Rep. t. 634; Bot. Reg. t. 75; Bot. Mag. t. 1790 (a form with less deeply divided leaves, which occurs also in Australia).

N. Australia. Arnhem Bays, *R. Brown*.

Queensland. Cape York, *Jardine*; Palm Island, *Burks and Schimper*; Port Maitland, *Gillivray*; Rockingham Bay, *Dallachy*.

A maritime plant, not uncommon on the coasts of tropical Asia, Africa, and America.

2. **I. Davenporti**, *F. Muell. Fragm.* vi. 97. Stems apparently twining, the whole plant hairy with a stellate almost floccose tomentum. Leaves petiolate, divided to the base into 3 (or more?) petiolulate leaflets mostly obovate and more or less lobed, 1 to 2 in. long, the lower ones probably larger. Peduncles longer than the leaves, bearing 1 or 2 rather large white flowers, with persistent leafy ovate or lanceolate acuminate bracts. Sepals acuminate, $\frac{1}{2}$ in. long, stellate-tomentose. Corolla broadly campanulate, about $1\frac{1}{2}$ in. long. Capsule glabrous, not seen ripe. Young seeds pubescent.

N. Australia. Davenport Range, *M. D. M. Street*. The specimens are little more than fragmentary, but the foliage and inflorescence are very different from those of any other species known to me.

3. **I. palmata**, *Burk.*; *Choisy*, in DC. Prodr. ix. 386. A glabrous twiner, the old stems often more or less tuberculate or muricate. Leaves digitately divided nearly or rarely quite to the base into 5 to 7 ovate-lanceolate lanceolate or oblong lobes, obtuse or rarely acute, 1 to 2 in. long. Peduncles usually several-flowered and as long as or longer than the petioles; petioles rather long. Sepals broad, obtuse, 3 to 4 lines long, all nearly equal. Corolla purple pink or white, campanulate but contracted into a tube towards the base, $1\frac{1}{2}$ to 2 in. long, the angles or short broad lobes generally terminating in acute points. Ovary 2-celled. Capsule globular, as long as the calyx. Seeds pubescent and usually bordered by long silky hairs. *I. pendula*, R. Br. Prodr. 486; Andr. Bot. Rep. t. 613; Bot. Reg. t. 632; Choisy, in DC. Prodr. ix. 387, with most of the synonyms adduced (but not *I. Horsfalliae*, Hook.); *I. pulchella*, Roth, and *I. tuberculata*, Rein. and Schult. Choisy, in DC. Prodr. ix. 386, with most but not all of the synonyms adduced.

Queensland. Moreton Bay, *Forster*, *F. Mueller*; Ipswich, *Nesbit*; Rockhampton, *O'Shaughnessy*; Edgecombe Bay, *Dallachy*; Mackenzie Island, *Thwait*; Curtis Island, *Henue*.

N. S. Wales. Port Jackson, *R. Brown*; Clarence and Hastings rivers, *Beckler*; Richmond river, *Henderson*; Tweed river, *C. Moore*; Lord Howe's Island, *M. Gillivray*.

The species is widely dispersed over tropical Asia, Africa, and America.

4. **I. quinata**, *R. Br. Prodr.* 186. A rather slender twiner, glabrous or the stems and foliage more or less hirsute with long spreading hairs. Leaves digitate, with 5 distinct lanceolate or narrow-oblong obtuse entire segments,

1 to 1½ in. long, contracted at the base. Peduncles usually 1-flowered and shorter than the leaves. Sepals ovate, the outermost about 3 lines long, the innermost nearly or quite twice as long. Corolla white or pale pink, campanulate but contracted into a tube towards the base, nearly 2 in. long, very shortly and broadly lobed or angled. Ovary 2-celled. Capsule ½ in. long, somewhat acuminate. Seeds glabrous.—Chois. in DC. Prod. ix. 385; *I. hirsuta*, R. Br. Prod. 486; *I. pentadactylis*, Chois. Conv. Or., and in DC. Prod. ix. 385; *Convolvulus quinatus*, Spreng. Syst. i. 590.

N. Australia. N. Coast, *R. Brown*, *Henne*; Arnhem N. Bay (the hairy form), *R. Brown*.

Queensland. Cape York and Port Moller, *M. G. Harvey*; Rockhampton, *Delachy*.

The species is also in Burmah and S. China.

5. ***I. diversifolia***, *R. Br. Prod.* 487. Stems very slender, trailing or twining, glabrous as well as the foliage. Leaves digitate, with very narrow linear segments, entire or more frequently toothed or pinnatifid, the central one 1 to 2 in. long, the others much shorter. Peduncles rather short and thick, mostly 1-flowered. Sepals oblong-lanceolate, acute, nearly equal or the inner ones rather longer. Corolla nearly 2 in. long, contracted into a tube towards the base. Capsule glabrous, globular, nearly as long as the calyx.—*Convolvulus diversifolius*, Spreng. Syst. i. 592.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. The leaves are not unlike those of the slender forms of *I. dissecta*, to which Choisy refers it, but the flowers are totally different.

6. ***I. dissecta***, *Willd. Phylegr.* 5. t. 2. Stems annual, slender, trailing or twining, glabrous as well as the foliage. Leaves digitate, with 3, 5 or rarely 7 linear or linear-cuneate segments, acute and once or even twice pinnatifid and toothed. Peduncles 1- or rarely 2-flowered, short in the Australian specimens, but often longer than the leaves in Indian ones. Sepals ovate or lanceolate, obtuse or shortly acuminate, all nearly equal, 2 to 2½ lines long, often muciculate on the midrib. Corolla white, campanulate, about twice as long as the calyx. Anthers oval-oblong, slightly twisted when fading. Ovary 3-celled; stigma capitate, 3-lobed.—*R. Br. Prod.* 487; Chois. in DC. Prod. ix. 363 (partly); *I. coplien*, Roth; Chois. in DC. Prod. ix. 384.

N. Australia. Islands off Cape Willmerforce, *R. Brown*; Victoria river, *F. Mueller*; Port Essington, *Armstrong*.

Queensland. Burdekin river, *Bowman*.

The species extends over tropical Asia and Africa.

SERIES 2. PHARBITIDES.—Leaves entire or 3- or 5-lobed. Ovary usually 3-celled. Sepals usually long and narrow. Corolla large, campanulate, more or less tubular towards the base.—*Pharbitis*, Chois.

The species of this group, many of them much cultivated in warm countries for the beauty of their flowers, are mostly nearly allied to each other and difficult to define, nor are the characters of the series constant, some species having been differently placed in *Pharbitis* or in *Ipomœa*, according as the ovaries examined have been 3- or 2-celled.

7. ***I. hederacea***, *Jacq. Collect.* i. 124; *Le. i. L.* 36. A tall herbaceous twiner, more or less hirsute, the hairs of the stem reflexed. Leaves petiolate, broadly cordate, more or less 3- or 5-lobed, the lobes acuminate, the

middle one broad or narrow, (but not linear), contracted or dilated at the base, the lateral ones shorter and broader, the whole leaf from $1\frac{1}{2}$ to 1 in. long. Peduncles short or rarely longer than the petioles, with 2 or 3 nearly sessile flowers at the end. Bracts linear. Sepals lanceolate, acuminate, broader and hispid with long hairs at the base, from $\frac{1}{2}$ in. to nearly 1 in. long. Corolla blue or purple, often above 2 in. long. Ovary almost always 3-celled. — R. Br. Prod. 486; Bot. Reg. t. 85; L. W. Roth, Catal. Bot. i. 36; *Pharbitis Nil* and *P. hederacea*, Choix. Conv. Or. and in DC. Prod. ix. 343, 344, with most, if not all, of the synonyms quoted.

N. Australia. Victoria river, *P. Mueller*.

Queensland. Bechy Island, *Banks and Solander*; Sutter and Bardsley rivers, *Leichhardt, Bancana*; Cape and Pinders rivers, *Bancana*; Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*; Moreton Bay, *Backhouse*.

Var. *limbata*, Hook. f. Bot. Mag. t. 5720. Flowers of a deep blue, with a pale or white margin. — *Pharbitis limbata*, Lindl. in Journ. Hort. Soc. v. 33; Hortic. in Gard. Mag. Bot. ii., with a fig. copied into Fl. des Serres, t. 608, and Linn. Jard. Fleur. t. 97. — Raised from N. Australian as well as from Javanese seeds.

The species is common in most tropical and subtropical regions of the New as well as the Old World, in some places, perhaps, escaped from cultivation.

S. I. congesta, R. Br. Prod. 485. A tall hirsute twiner, nearly allied to *I. hederacea*, but generally larger and the hairs less spreading. Leaves broadly cordate-ovate, acuminate, entire (or obscurely 3-lobed?), usually 3 to 4 in. long. Peduncles longer than in *I. hederacea*, bearing a dense cyme of 3 or more large blue purple or pink flowers. Sepals lanceolate, acuminate, $\frac{3}{4}$ in. long. Corolla nearly 3 in. long. Ovary 3-celled. — Choix. in DC. Prod. ix. 369; *Convolvulus congestus*, Spreng. Syst. i. 601; *Pharbitis insularis*, Choix. Conv. Or. and in DC. Prod. ix. 341.

Queensland. Endeavour river, *Banks and Solander*; Rockingham Bay, *Dallachy*. Also in Norfolk Island and in the islands of the S. Pacific.

*9. **I. purpurea**, Roth, Catal. i. 36. Stems twining, more or less hirsute with reflexed hairs or rarely glabrous. Leaves cordate-ovate, acuminate, entire or very rarely somewhat 3-lobed, glabrous or the petioles and veins pubescent, mostly 2 to 4 in. long. Peduncles longer than the petioles, bearing 1, 2 or 3 pedicellate flowers. Bracts small and narrow. Sepals lanceolate, scarcely acuminate, under $\frac{1}{2}$ in. long, mostly hairy at the base. Corolla often above 2 in. long, purple blue pink or rarely white or variegated, campanulate, more or less tubular towards the base. Ovary 3-celled. — *Convolvulus purpureus*, Linn.; Bot. Mag. t. 113, 1005, 1682; *Pharbitis hispida*, Choix. Conv. Or. and in DC. Prod. ix. 341.

Queensland. Curriwillighi, *Dalton*.

N. S. Wales. Darling Downs, *P. Law*.

The species is of American origin, long since cultivated in tropical as well as in European gardens, and become naturalized in many places. The above Australian stations are therefore probably also escapes from cultivation.

SERIES 3. CALYCINÆ. Leaves entire or lobed at the base. Ovary 2-celled. Sepals large, obtuse, usually $\frac{3}{4}$ to 1 in. long at least after flowering. Corolla large, campanulate or tubular at the base, above $1\frac{1}{2}$ in. and sometimes 3 in. long.

10. ***I. peltata***, Choisy, *Contr. Or. and in DC. Prod.* ix. 359. A tall woody twiner, with a milky juice (*Seemann*), covering whole trees with its dark green foliage (*Dallachy*), quite glabrous or the veins of the leaves hairy underneath. Leaves broadly ovate, shortly acuminate, more or less peltate or the upper ones cordate with a narrow sinus, 6 to 10 in. long. Flowers large, usually white, in loose cymes on a common peduncle usually shorter than the petiole. Sepals broad, obtuse, coriaceous, nearly equal, about $\frac{3}{4}$ in. long when in flower. Corolla broadly campanulate, at least 2 in. long. Anthers large, glabrous in our specimens, woolly according to Choisy. Fruit not seen.

Queensland. Rockingham Bay, *Dallachy*. Also in the Mascarene Islands, in the Indian Archipelago, and in the islands of the S. Pacific. The flowers are white, according to Dallachy and Seemann, white or purplish according to Desrousseaux (*Lam. Dict.* iii. 672), sulphur-coloured according to Blume, yellow according to Choisy.

11. ***I. alata***, *R. Br. Prod.* 484. A tall twiner, quite glabrous. Leaves petiolate, cordate-ovate or ovate-lanceolate, acuminate with the point usually long and fine, sometimes angular or lobed at the base, 3 to 4 in. long, the petiole often winged. Peduncles rather longer than the petiole, often winged, bearing each a single rather large white flower. Sepals very broad, obtuse, coloured, nearly 1 in. long at the time of flowering. Corolla campanulate, about 2 in. long. Fruit not seen.—Choisy, in *DC. Prod.* ix. 369; *Convolvulus alatus*, Spreng. *Syst.* i. 596.

N. Australia. Islands off Cape Wilberforce, *R. Brown*.

The S. American *I. altissima*, Mart., and the Central American *I. codonantha*, Benth., cannot in the dried state, when in flower, be distinguished from *I. alata*. There may, however, be differences in the seeds, and we have no similar species either from Asia or Africa.

12. ***I. Turpethum***, *R. Br. Prod.* 485. A tall twiner, the young parts, foliage, and inflorescence softly pubescent, the old stems often bordered by narrow longitudinal wings. Leaves petiolate, mostly broadly cordate-ovate and acuminate, but sometimes obtuse or angular at the base, 2 to 4 in. long, or when luxuriant twice that size. Peduncles usually shorter than the leaves, bearing a short raceme of few rather large white flowers, but sometimes 1-flowered. Bracts ovate, thin, coloured, $\frac{1}{2}$ to 1 in. long, very deciduous. Pedicels at first short and thick, but lengthening to 1 in. Outer sepals broadly ovate, often $\frac{3}{4}$ in. at the time of flowering and lengthening to 1 in., the inner ones rather smaller. Anthers large, much twisted when fading. Ovary 2-celled. Capsule much shorter than the calyx, globular, membranous. Seeds glabrous.—Choisy, in *DC. Prod.* ix. 360; *Bot. Reg.* t. 279; *Convolvulus Turpethum*, Linn.; *Bot. Mag.* t. 2093; Wight in Hook. *Bot. Misc.* iii. t. Suppl. 38; *I. anceps* and *I. triquetra*, Rott. and Schult.; Choisy, in *DC. Prod.* ix. 360; *Argyria alulata*, Miq. *Fl. Ind. Bat.* ii. 587.

Queensland. Broad Sound, *R. Brown*; Lizard Island, *McGillivray*; St. Charles Hardy's Island, *Henao*; Satter river, *Burrows*; Flinders river, *Sutherland*; Rockhampton, *O'Shaneys*. The species extends from the Mauritius and Ceylon over the peninsula of India, the Himalayas, and the Eastern Archipelago, as far north as Formosa, and is also said to be in the West Indies, probably introduced from Asia.

13. ***I. longiflora***, *R. Br. Prod.* 484. A tall twiner, glabrous or the

Leaves sparingly pubescent underneath. Leaves petiolate, broadly cordate-ovate, acuminate, entire or somewhat 3-lobed, with rounded auricles, mostly 2 to 4 in. long. Peduncles shorter or rather longer than the petioles, bearing 1 or rarely 2 or 3 large (pale purple or pink?) flowers. Bracts very small; pedicels short. Sepals obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, all nearly equal in length, but the outer ones broad and almost cordate at the base, of a much firmer consistence than in *I. Turpetiana*, and when in fruit above 1 in. long. Corolla $2\frac{1}{2}$ to 3 in. long, the tube cylindrical at the base but dilated upwards and not nearly so slender as in *I. Bonapartei*. Anthers included in the tube. Capsule ovoid or globular, $\frac{3}{4}$ to 1 in. diameter or even larger. Seeds large, minutely silky-pubescent, and usually, but not always, either bordered or covered all over with long woolly hairs.—*I. acroanthæ*, Rott. and Schult. Syst. iv. 251; *Convolvulus longiflorus*, Spreng. Syst. i. 595.

N. Australia. Islands in the Gulf of Carpentaria, R. Brown; Victoria river, F. Mueller; Escape Cliffs, Halls.

Queensland. Blackfin river, the name only by the natives, *Hoo-oo*; Rockin-haw Bay, Dallachy; Rockhampton, O'Shanassy.

Choisy in DC. Prod. ix. 345, unites this with *I. Phœnicea*, a species differing widely in its acuminate sepals, hypocrateriform corolla, exserted stamens, and glabrous seeds. I cannot, however, as far as our specimen goes, distinguish *I. juvencula*, Thw. Enum. Pl. Zeyl. 211 and 426, and *Calonyction canaspermat.* Buj.; Choisy in DC. Prod. ix. 346, from *I. longiflora*; and if these be really the same, the species has a wide range from E. tropical Asia to Ceylon, the Indian Archipelago, and the S. Pacific islands.

14. ***I. costata*, F. Muell. in Herb. No. 4.** Stems apparently woody and probably twining, our specimens quite glabrous. Leaves petiolate, cordate, orbicular or reniform, very obtuse and sometimes emarginate, 1 to 3 in. broad. Peduncles very short, bearing 1 to 3 large flowers, on pedicels much longer than the peduncles, the bracts very small or none. Sepals $\frac{1}{2}$ to $\frac{3}{4}$ in. long, lengthening to nearly 1 in. when in fruit, almost acute, the outer ones usually rugose and rather shorter. Corolla nearly 3 in. long. Ovary 2-celled, with 2 ovules in each cell. Capsule globular, apparently indehiscent or circumsciss about the middle. Seeds pubescent.

N. Australia. Start's Creek, F. Mueller; Attek Creek, W. Dowell Stuart. The species requires further investigation. The fruit shows some approach to that of *Argyriaea*, but the plant has not at all the aspect of that genus.

SERIES 4. SPECIOSÆ.—Leaves entire toothed or lobed at the base. Ovary 2-celled or spuriously 4-celled. Sepals moderate or small, rarely attaining $\frac{1}{2}$ in. Corolla large ($1\frac{1}{2}$ to 3 inches long), often more or less tubular at the base, usually pink purple or white.

15. ***I. Pes-capræ*, Roth, Nov. Sp. Pl. 109.** A glabrous perennial, with long prostrate creeping or trailing stems. Leaves on long petioles, oval obovate or orbicular, broadly emarginate or very obtusely 2-lobed, rather thick, with nearly parallel oblique veins, the lower ones converging at the base of the leaf, mostly 2 to 3 in. long. Peduncles often as long as the leaves, bearing 1 or 2 rather large pink flowers on rather long pedicels. Sepals obtuse, about 3 lines long or the inner ones rather longer. Corolla broadly campanulate, somewhat tubular at the base, about $1\frac{1}{2}$ in. long. Ovary more or less perfectly 4-celled, at least at the time of flowering. Capsule 2-celled,

ovoid or nearly globular, coriaceous, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Seeds hairy.—*Convolvulus Pes-capræ*, Linn. Spec. Pl. 226; *C. maritimus*, Desr. in Lam. Dict. iii. 550; *Ipomœa maritima*, R. Br. Prod. 486; Bot. Reg. t. 319, and probably all the synonyms adduced by Choisy in DC. Prod. ix. 349, under *I. Pes-capræ* except *I. carnosa*.

N. Australia. Glenelg river and Brecknock Harbour, N.W. coast, *Mortra*; Niel of Bay, *Ridley's Expedition*; N. coast, *R. Brown*; Swears and other islands, and Albert river, *Henne*; Escape Cliffs, *Hulls*.

Queensland. Torres Straits, *F. Mueller*; Harvey Bay, Sandy Cape, *R. Brown*; Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Mackenzie Island, *Sutherland*.

N. S. Wales. Richmond river, *Pawcett*, *Henderson*.

The species is common on the seacoasts of most tropical countries in the New as well as the Old World. Although placed by Choisy in *Ipomœa*, there is generally a more or less developed, spurious, transverse dissepiment between the ovules and young seeds, subdividing each cell into two.

16. ***I. carnosa***, R. Br. Prod. 485. A prostrate or creeping glabrous perennial. Leaves petiolate, mostly ovate or oblong, very obtuse or emarginate, cordate at the base, thick and somewhat fleshy, penniveined, and $\frac{1}{2}$ to 1 in. long, but sometimes with 1 or 2 very prominent basal lobes on each side, and in some specimens (not Australian) long and narrow with a hastate base. Peduncles short, bearing 1 or rarely 2 or 3 rather large white flowers. Sepals rather narrow, 4 to 5 lines long at the time of flowering, subsequently enlarged, the outer ones mucronate-acute, the inner ones obtuse and often rather longer. Corolla campanulate, about $1\frac{1}{2}$ in. long. Capsule nearly globular, more or less perfectly 4-celled, about $\frac{1}{2}$ in. diameter, glabrous. Seeds densely woolly-hairy.—*Convolvulus carnosus*, Spreng. Syst. i. 609; *Batatas littoralis* and *B. acetosifolia*, Choisy in DC. Prod. ix. 337, 338, with most, if not all, of the synonyms adduced; *Convolvulus stoloniferus*, Cyr. Pl. Rar. 14. t. 5 (very good).

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. The species is dispersed along the coasts of the warmer regions of Asia, Africa, and America, extending beyond the tropics to the shores of the Mediterranean. Although placed by Choisy in a different genus from *I. Pes-capræ*, it is very nearly allied to it, differing chiefly in the narrower, more fleshy, and less prominently veined leaf, and the spurious dissepiments usually but not always, more perfect and more permanent in the fruit. Grisebach (H. Brit. W. Ind. 471) places it in a section with glabrous seeds, but I have always found them very woolly in American as well as in African and European specimens.

17. ***I. reptans***, Poir.; Choisy in DC. Prod. ix. 349. A glabrous perennial, with long, prostrate, trailing or floating and hollow stems, often rooting at the nodes and sometimes bearing short ascending branches. Leaves on long petioles, from ovate to linear-lanceolate, acuminate, always cordate or hastate at the base, the angles rounded or produced into broad or narrow acute auricles, the leaf usually 2 to 4 in. long, but rarely on the smaller branches a few small ovate-cordate and obtuse ones. Peduncles 1- or few-flowered. Sepals rather obtuse, 3 to 4 lines long. Corolla not so broad as in the two preceding species, more tubular at the base, pink purplish or white, about $1\frac{1}{2}$ in. long. Filaments hairy at the base. Ovary 2-celled. Capsule globular, coriaceous, apparently indehiscent or bursting irregularly. Seeds large, woolly, often reduced to 2.

N. Australia. Upper Victoria river, *F. Mueller*, Adams Bay, *Halls*.

Queensland. Flinders river, *Sutherland*; Cape river, *Boorman*.

The species is found in marshy or wet sandy places, or floating in water, in many parts of tropical Asia and Africa.

18. **I. graminea**, *R. Br. Prod.* 485. A slender glabrous twiner. Leaves on short petioles, linear-lanceolate or linear, entire, 4 to 5 in. long. Peduncles 1-flowered, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long (including the pedicel), with very small distant bracts. Sepals oblong, obtuse, $\frac{1}{2}$ in. long or rather more, the outermost one shorter. Corolla $2\frac{1}{2}$ to 3 in. long, contracted into a slender tube. —*Chois. in DC. Prod.* ix. 367; *Convolvulus gramineus*, Spreng. Syst. i. 607.

N. Australia. Islands off Cape Wilberforce, *R. Brown* (*Herb. R. Br.*). This species is unlike any other one known to me. The corolla is nearly that of *I. longiflora*, but more slender.

19. **I. velutina**, *R. Br. Prod.* 485. A tall twiner, apparently woody at the base, softly velvety-pubescent or villous all over, the hairs usually reflexed on the branches, often silky on the leaves. Leaves petiolate, broadly ovate-cordate, obtuse or shortly acuminate, entire, 2 to 4 in. long. Peduncles about as long as the petioles or sometimes longer, bearing a dichotomous cyme of several large flowers, rarely reduced to a single flower on the side branches. Bracts very deciduous or none. Sepals broad, very obtuse, glabrous or nearly so, 3 to 4 or even 5 lines long. Corolla fully 3 in. long, contracted into a tube at the base. —*Chois. in DC. Prod.* ix. 369; *Convolvulus velutinus*, Spreng. Syst. i. 601.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. A specimen in *Herb. Hook.* from *Cleaves's* collection, appears to be a seedling of the same species. *Brown's* specimens have the indurated base of *I. longiflora*, with a very different foliage, and the corolla of *I. longiflora*, but with a much smaller calyx.

20. **I. abrupta**, *R. Br. Prod.* 485. A tall woody twiner, glabrous or nearly so. Leaves petiolate, cordate-ovate, obtusely acuminate or almost acute, entire, from 2 or 3 in. long, to twice that size. Flowers large, in pedunculate cymes, rarely reduced on lateral branches to single flowers. Sepals obtuse, coriaceous, 3 to 4 or rarely 5 lines long. Corolla fully 3 in. long, contracted into a tube at the base. —*Chois. in DC. Prod.* ix. 370; *Convolvulus abruptus*, Spreng. Syst. i. 596.

N. Australia. N. coast, *Bauer* (*Herb. Banks*); Escape Cliff, *Halls*; Gloster Island, *Menne* (both in *Herb. F. Muell.*).

Queensland. Burdekin river, *Herb. F. Mueller*.

This appears to differ from *I. velutina* chiefly in its glabrous stems and foliage, and may be a variety only of that species. It has the corolla of *I. longiflora*, but a much smaller calyx and the flowers usually cymose; but the specimens I have seen are all single and fragmentary. The one named by *Brown* in the *Banksian* herbarium appears to be a side branch, with 1-flowered peduncles; the three others have cymose flowers. It is wanting in *Brown's* own herbarium.

21. **I. denticulata**, *Chois. in DC. Prod.* ix. 379, not of *R. Br.* Glabrous or nearly so; stems rather slender, prostrate and trailing or twining. Leaves petiolate, deeply cordate, ovate, obtuse or acute, broad or narrow, the basal auricles rounded, with occasionally an acute tooth or angle on the outer

side, the whole leaf 1 to 2 in. long. Pedicels rather long, often above 1 in., solitary or few together on a very short common peduncle, with minute bracts. Sepals obtuse or mucronate, about 4 lines long, coriaceous but often with membranous margins. Corolla $1\frac{1}{2}$ to nearly 2 in. long. Capsule depressed-globular, shorter than the calyx, not wrinkled. Seeds glabrous.—*I. carnea*, Forst. Prod. 15, not of Jacq.; *I. laciniata*, Soland. (not Steud.) in Herb. Banks; *I. littoralis*, Thw. Enum. Pl. Zeyl. 211, not of Blume.

Queensland. Cape York, *Dorril*; Rockingham Bay, *Dallachy*. Also in Ceylon, the Eastern Archipelago, and in the Society and Sandwich Islands.

I refer this to *Convolvulus denticulatus*, Desr., transferred to *Ipomœa* by Choisy, on the authority of a Society Island specimen, evidently the one described by Forster, determined by Choisy, in the Banksian herbarium, but the specific name is scarcely applicable. Blume's *I. littoralis*, from his short character and from Miquel's description, is evidently a very different plant, probably closely allied to, if not identical with, *I. periformis*. Some of Dallachy's specimens of *I. denticulata* have the leaves more cordate and acutely auriculate, almost like those of *I. gracilis*, but with the calyx of *I. denticulata*.

22. ***I. gracilis***, R. Br. Prod. 484. A rather slender twiner, glabrous or scabrous-pubescent. Leaves on long petioles, lanceolate-lanceate or triangular-cordate, acute, mostly 1 to 2 in. long, the basal lobes or auricles usually acute long and divergent or curved inwards towards the end, but varying in breadth and sometimes but rarely almost obtuse. Peduncles, including the pedicel, as long as the petioles, bearing a single rather large white flower, the bracts very small. Sepals broadly lanceolate, acute or acuminate or rarely obtuse, 4 to 5 lines long or 6 lines when in fruit. Corolla about 2 in. long. Capsule globular, smooth, 5 to 6 lines diameter. Seeds shortly pubescent, with a tuft of longer hairs at the hilum.—Choisy in DC. Prod. ix. 370; *Convolvulus gracilis*, Spreng. Syst. i. 604.

N. Australia. Islands of the Gulf of Carpentaria and off Cape Wilberforce, *R. Brown*.

Queensland. Bowen river and Brawl Creek, *Barram*; Rockingham Bay, *Dallachy*.

Although, generally speaking, this species is readily distinguished by its aspect from *I. denticulata*, it is difficult to assign any positive limits between the two. The more twining habit, acutely hastate leaves, and acute sepals of *I. gracilis*, are none of them without exceptions, and the seeds have been observed in too few specimens to judge of the constancy of the character derived from their hairs.

23. ***I. sepiaria***, Karst.; Choisy in DC. Prod. ix. 370. A twiner, either quite glabrous or the stems hirsute with long spreading or reflexed hairs. Leaves petiolate, broadly cordate-ovate, obtuse or shortly and obtusely acuminate, the basal auricles rounded or angular, mostly 1 to 3 in. long. Peduncles rather rigid, longer than the petioles, bearing a dense cyme or cluster of 3 to 5 pink or white flowers on short pedicels. Bracts small, narrow, often persistent. Sepals ovate-lanceolate, acute or mucronate, varying from $2\frac{1}{2}$ to 4 lines in length, the outer ones often rugose. Corolla about $1\frac{1}{2}$ in. long. Capsule globular, somewhat depressed, smooth. Seeds glabrous.—Wight, Ic. t. 838.

Queensland. Cape river, *Bowman* (Herb. P. Muell.).

N. S. Wales. Between Darling River and Cooper's Creek, *Nelson* (Herb. E. Muell.).

The species is dispersed over E. India and the Eastern Archipelago. I describe it chiefly from Indian specimens, and refer to it the two from Australia above quoted with much

hesitation. They are mere fragments, and may belong to *I. Muelleri*, but have much more the aspect of the true *I. sepiaria*. The flowers are rather larger than they are usually in India, but there also it occasionally occurs with similar large flowers.

24. *I. Muelleri*, Benth. A glabrous rather slender twiner. Leaves on rather long petioles, very broadly cordate-ovate, obtuse, with rounded basal auricles, entire, 1 to 2 in. long. Peduncles shorter or at length longer than the petioles, bearing 1 to 3 flowers on very short pedicels. Bracts very small. Sepals broad, obtuse or scarcely acuminate, 4 to 5 lines long. Corolla apparently pink, rather above 1 in. long. Capsule globular, smooth, as long as the calyx. Seeds villous.

N. Australia. Nichol Bay, Walcott; Start's Creek, E. Mueller; in the interior, lat. 15° 30', M'Donell Street's *Expedition*. Evidently nearly allied to *I. sepiaria*, but the flowers are smaller and the seeds villous.

SERIES 5. CAMPANULATE.—Leaves entire toothed or lobed at the base. Ovary 2-celled. Corolla moderate or small, rarely exceeding 1 in. in length, usually broadly campanulate, yellow white or pink.

25. *I. cymosa*, Remy and Schult.; Chois. in DC. Prod. ix. 371. A rather coarse twiner, glabrous or softly pubescent, usually turning dark brown in drying. Leaves petiolate, from ovate to oblong or lanceolate, shortly acuminate or obtuse, the larger ones broadly cordate or almost sagittate, the narrow ones rounded at the base. Flowers of a pure white or with a yellow eye, in cymes of 6 to 12 or even more, rarely solitary or nearly so, on a short rather thick common peduncle. Sepals 2 to 3 or in some Indian specimens nearly 4 lines long, glabrous, coriaceous, nearly equal in length. Corolla campanulate, 1 in. long or even larger, often hairy outside at the top. Ovary 2-celled. Capsule shortly acuminate, longer than the calyx. Seeds clothed with long soft loose hairs.—Bot. Reg. 1843, t. 24.

Queensland. Rockingham Bay, Dallachy, sometimes covering the trees with a sheet of white flowers. The species is common in the greater part of India and the Archipelago, and is scarcely to be distinguished from the *I. umbellata* of tropical America and Africa, except by the colour of the flowers, which, in the latter species, is yellow.

26. *I. linifolia*, Blume; Chois. in DC. Prod. ix. 369. A slender twiner, glabrous or clothed or sprinkled with long silky hairs. Leaves petiolate, narrow-lanceolate, entire, rounded or truncate at the base, 1 to 2 in. long. Peduncles slender, mostly about as long as the leaves, bearing sometimes a forked cyme, more frequently a simple loose 1-sided raceme of 3 or more yellow flowers, the bracts small but persistent. Pedicels nearly as long as the calyx. Sepals ovate or lanceolate, acute, nearly equal, 2½ to nearly 3 lines long. Corolla campanulate, about ¾ in. long. Ovary 2-celled, but the dissepiment usually drying up after flowering. Capsule small, smooth, globular, usually 1-celled. Seeds 4, glabrous.—*Skinneria caespitosa*, Chois. Conv. Or. t. 6, and in DC. Prod. ix. 435.

Queensland. Rockingham Bay, Dallachy. Common in India and the Eastern Archipelago. I refer this plant to Blume's *I. linifolia*, on the authority of a specimen received from Miquel under that name, which agrees well with Blume's short diagnosis.

27. *I. chryseides*, Ker. Bot. Reg. t. 279. A slender glabrous twiner.

Leaves on long petioles, broadly ovate-cordate or almost hastate, acuminate, 1 to 2 in. long, entire or with 2 broad rounded and sometimes toothed basal lobes. Peduncles as long as the leaves or nearly so, with 2 spreading branches, each bearing 2 to 4 small yellow flowers, with 1 in the fork. Sepals 2 to 2½ lines long, obovate or broadly oblong, truncate or retuse and herbaceous at the end, with a small recurved point in the centre, giving the cyme a squarrose aspect. Corolla broadly campanulate, not twice as long as the calyx. Stamens and style often as long as the corolla or nearly so. Capsule 3 to 4 lines diameter, nearly globular, with 4 raised longitudinal ribs and usually transversely wrinkled when quite ripe. Seeds pubescent.—Chois. in DC. Prod. ix. 382; Wight, Ic. t. 157.

Queensland. Rockingham Bay, *Dallachy*. Common in E. India and the Archipelago.

28. **I. flava**, *P. Muell. Herb.* A rather slender glabrous twiner. Leaves petiolate, cordate-ovate, mostly acuminate, with large rounded or angular basal auricles, or the upper ones lanceolate-sagittate, 1 to 2 in. long. Peduncles rather long, bearing an irregular dense cyme of very few yellow or nearly white flowers on short pedicels or sometimes the flower solitary. Bracts very small. Sepals ovate or oblong, obtuse, rigid but smooth and almost membranous, 3 to 4 lines long. Corolla campanulate, apparently about 1 in. long. Anthers rather large. Capsule globular, coriaceous, at length wrinkled, about 4 lines diameter. Seeds glabrous.

N. Australia. Albert river and its tributaries, *E. Mueller*. Abundant on flats subject to inundations on Alligator river, *A. Cunningham*. Raised also in Kew Gardens from a seed gathered on De Grey River in Ridley's Expedition. Allied to *I. cheysseides*, but the peduncle longer, the flowers fewer and twice as large, and the calyx different. The single specimen from Kew Gardens had only produced its first flower, but appeared to belong to the same species, although the flower was almost white.

29. **I. obscura**, *Ker. Bot. Reg. t. 239*. A slender glabrous or pubescent twiner. Leaves on slender petioles, broadly and deeply cordate-ovate, acuminate, from under 1 in. to nearly 2 in. long and broad. Peduncles as long as the petioles, bearing 1 or rarely 2 or 3 yellow flowers. Sepals lanceolate, acute, scarcely 2 lines long in the common form. Corolla campanulate, ¾ to 1 in. long. Capsule globular, smooth. Seeds pubescent. Chois. in DC. Prod. ix. 370; *Convolvulus obscurus*, Linn. Spec. Pl. 220; *I. lateola*, R. Br. Prod. 485; Chois. in DC. Prod. ix. 369; *I. Brownii*, Rasm. and Schult. Syst. iv. 252.

Queensland. Keppel Bay, *R. Brown*; Cape River, *Bowman*. Common in tropical Asia, extending into tropical Africa and eastward to the Archipelago. The Australian specimens seem to have rather smaller flowers than the Indian ones, but they are very imperfect. The species is readily distinguished from its nearest allies by the small calyx.

30. **I. incisa**, *R. Br. Prod. 186*. Prostrate trailing or scarcely twining, pubescent villous or nearly glabrous, the branches rather slender but sometimes very long. Lower leaves broadly ovate-cordate and deeply and irregularly toothed or lobed, especially below the middle; upper ones oblong or lanceolate, hastate or almost digitate with one long central lobe and several

short lateral ones. Peduncles long and slender, bearing 1 or rarely 2 or 3 pink or purplish flowers, the pedicels as long as the calyx, the bracts minute. Sepals lanceolate or ovate-lanceolate, acute or rather obtuse, about 3 lines long. Corolla campanulate, $\frac{3}{4}$ to nearly 1 in. long. Ovary 2-celled. Fruiting calyx slightly enlarged, the capsule globular and smooth. Seeds glabrous.—Chois. in DC. Prod. ix. 352; *Convolvulus incisus*, Spreng. Syst. i. 609.

N. Australia. Upper Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

I. cinerascens, R. Br. Prod. 486; Choisy, in DC. Prod. ix. 359 (*Convolvulus cinerascens*, Spreng. Syst. i. 609), from the islands off Cape Willmerfore, appears to me to be only a more villous form of *I. incisus*, the flowers perhaps rather smaller.

31. I. uniflora, *Roem. and Schult. Syst. iv. 247.* A glabrous or somewhat silky-pubescent rather slender twiner. Leaves oblong to linear, obtuse or mucronate, entire, narrowed into a short petiole, mostly 1 to 3 in. long. Peduncles shorter than the leaves, bearing usually a single white flower, the pedicel as long as or longer than the calyx, the bracts very minute. Sepals leafy, acute, the outer ones broad and shortly decurrent on the pedicel, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the inner ones smaller and narrower. Corolla campanulate, longer than the calyx, but rarely exceeding 1 in., more or less hairy outside. Ovary 2-celled. Capsule globular. Seeds glabrous puberulous or bordered by short hairs.—*Aniseia uniflora*, Choisy. Conv. Or., and in DC. Prod. ix. 431; Wight, Ic. t. 850; *A. martinicensis* and *A. ensifolia*, Choisy. Conv. Or., and in DC. Prod. ix. 430; *A. cernua*, Moric. Pl. Amer. t. 38; Choisy, in DC. Prod. ix. 431, and perhaps some other species referred by Choisy to *Aniseia*.

Queensland. Rockingham Bay, *Dallachy*. The species is widely dispersed over tropical Asia, Africa, America, and the Pacific islands.

32. I. angustifolia, *Jacq. Collect. ii. 367, and Ic. Rar. t. 317, not of Choisy.* A glabrous annual, with slender prostrate trailing or twining stems, usually drying of a black or brown colour. Leaves on very short petioles or almost sessile, linear or lanceolate, acute or acuminate, cordate or hastate, and often toothed at the base, 1 to 2 or even 3 in. long when very luxuriant. Peduncles slender, longer than the leaves, bearing 1 or 2 small yellowish-white flowers. Sepals ovate-lanceolate or lanceolate-acuminate, about 3 lines long. Corolla campanulate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Stamens rather long. Ovary 2-celled. Seeds glabrous.—*I. filicaulis*, Blume; Choisy, in DC. Prod. ix. 353; Bot. Mag. t. 5426; *I. denticulata*, R. Br. Prod. 485; Bot. Reg. t. 317.

N. Australia. Montague Sound, N.W. coast, *A. Cunningham*; Camden and Brecknock Harbours, *Martin*; Upper Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown, Henne*; Port Essington, *Armstrong*.

Queensland. Cape York, *Damrel*; Rockingham Bay, *Dallachy*; Cape River, *Bauman*.

The species is widely dispersed over tropical Africa and Asia. R. Brown's Australian specimens include a narrow-leaved form corresponding precisely with the Guinea plant originally described by Jacquin and by Vahl, together with the broader-leaved form more prevalent in E. India and the Archipelago.

33. ***I. plebeia***, *R. Br. Prod.* 484. A slender twiner, softly pubescent and sprinkled with rather long hairs, which are reflexed on the branches, scattered on the leaves or sometimes wanting. Leaves on slender petioles, cordate-lanceolate or the lower ones broadly ovate-cordate, acuminate, entire or obscurely 3-lobed, with the basal auricles rounded, $1\frac{1}{2}$ to 3 in. long. Peduncles slender, 1-flowered, articulate and minutely bracteate near the base (the peduncle much shorter than the pedicel). Outer sepals ovate-lanceolate, subulate-acuminate, hispid, about 4 lines long; the inner ones smaller. Corolla campanulate, fully $\frac{1}{2}$ in. long, often pubescent at the top. Stigma with 2 globular lobes. Capsule shorter than the calyx, glabrous, 2-celled. Seeds pubescent.—*Convolvulus plebeius*, Spreng. Syst. i. 601; Choisy. in DC. Prod. ix. 412.

Queensland. Bay of Inlets, *Banks and Solander*; islands of Moreton Bay, *F. Mueller*; Walloon and Comet river, *Bowman*. It does not appear for what reason Choisy removed this plant to the genus *Convolvulus*; the stigma is certainly that of *Ipomœa*, where Brown placed it.

34. ***I. eriocarpa***, *R. Br. Prod.* 481. A twining annual, more or less hirsute with rigid hairs, mostly reflexed on the stem, scattered on the under side of the leaves or confined to the margins and principal veins. Leaves petiolate, from deeply cordate-ovate to lanceolate or hastate, acuminate, 1 to 3 in. long, the upper surface usually glabrous. Peduncles exceedingly short, bearing 1, 2 or rarely more small flowers either quite sessile or very shortly pedicellate. Sepals ovate or ovate-lanceolate, acuminate, hirsute, 2 to 3 lines long. Corolla scarcely exceeding the calyx or sometimes not so long in Australian specimens, rather larger in some extra-Australian ones, slightly hirsute outside. Stigma with 2 globular lobes. Capsule globular, pubescent or hirsute, but becoming nearly glabrous when ripe. Seeds glabrous.—Choisy. in DC. Prod. ix. 369; *Convolvulus eriocarpus*, Spreng. Syst. i. 598; *Ipomœa sessiliflora*, Roth; Choisy. in DC. Prod. ix. 366; Wight, Ic. t. 169 (a remarkably luxuriant large-leaved specimen, apparently with an 8-seeded fruit, probably by a mistake of the artist); *I. Horsfieldiana*, Miq. Pl. Ind. Bat. ii. 611.

N. Australia. Upper Victoria river, *F. Mueller*.

Queensland. Endeavour river, *Banks and Solander*; Burdekin river, *Bowman*, Fitzalan.

The species is common in tropical Africa and Asia, and is also (probably introduced) in the West Indies.

35. ***I. heterophylla***, *R. Br. Prod.* 487. Stems erect or ascending, not twining, rather slender, simple or branched, 1 to 2 ft. high, more or less hirsute, as well as the foliage, with long loose hairs, rarely at length nearly glabrous. Leaves petiolate, lanceolate or oblong, quite entire or bordered by coarse teeth or lobes, especially below the middle, never cordate, 1 to 3 in. long, the upper ones small and narrow. Peduncles very short or the flowers almost sessile, between 2 linear bracts or bracteoles almost as long as the calyx. Sepals lanceolate, subulate-acuminate, ciliate and hispid with long hairs, 3 to 4 lines long. Corolla campanulate, rather longer than the calyx. Stigmas large and broad, usually distinct. Capsule and seeds glabrous. Choisy. in DC. Prod. ix. 354; *I. polymorpha*, Rœm. and Schult. Syst. iv. 254;

Convolvulus Brownii, Spreng. Syst. i. 612, altered in the Index to *C. Robertianus*.

N. Australia. Victoria river, *P. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*; Port Essington, *Armstrong*.

Queensland. Cape York, *Daemel*; Flinders river, *Sutherland*; Rockhampton, *O'Shanesy*; Curriwillighi and Armadillo, *Dalton*.

36. **I. erecta**, *R. Br. Prod.* 187. Stems from a perennial base, erect or ascending, simple or lightly branched, very tomentose or villous as well as the foliage and inflorescence, the hairs intricate on the branches, more appressed on the leaves, and often rust-coloured. Leaves very shortly petiolate, oblong or lanceolate, obtuse or acute, not cordate, 1 to 2 in. long, the upper ones smaller and narrower. Peduncles mostly shorter than the leaves, bearing 1, 2 or 3 pink flowers, the pedicels short, the bracts very small. Sepals ovate-lanceolate, rather acute, softly villous or nearly glabrous, of a somewhat firmer consistence at the base as in many species of *Convolvulus*, the outer ones 3 to 4 lines long, the inner ones smaller. Corolla campanulate, about $\frac{3}{4}$ in. long. Stigmatic lobes very broadly ovate, recurved. Capsule globular, readily splitting into 6 to 8 valves, as in *Convolvulus parviflorus* and its allies. Seeds glabrous.—*Chois. in DC. Prod.* ix. 354; *Convolvulus erectus*, Spreng. Syst. i. 612.

N. Australia. Victoria river, *P. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*, *Heene*; near Caledon Bay, *B. Geell*; in the interior, Attack Creek, Newcastle Water, Strangeways river, etc., *M'Donnell Stuart*.

I. pannosa, *R. Br. Prod.* 187; *Chois. in DC. Prod.* ix. 356 (*Convolvulus pannosus*, Spreng. Syst. i. 612), from the mainland, Carpentaria, appears to me to be only a densely villous form of the same plant, and *I. biflora*, *R. Br. l. c.*; *Chois. l. c.* 367 (*I. diantha*, *Rom. and Schult. Syst.* iv. 254; *Convolvulus flavosus*, Spreng. Syst. i. 612), a slight variety with more slender branches, sometimes almost twining at the extremity. The species, both in habit and in character, shows a slight approach to the genus *Convolvulus*.

SERIES 6. URCEOLATE.—Leaves entire. Ovary 2-celled. Corolla small, urceolate, the short broad tube contracted at the throat.

37. **I. urceolata**, *R. Br. Prod.* 185. A tall twiner, softly villous, the hairs of the branches reflexed, those of the foliage almost silky. Leaves petiolate, cordate-ovate, acuminate, entire, 3 to 4 in. long. Flowers numerous, in dense almost sessile cymes or clusters, the pedicels much longer than the calyx. Sepals orbicular or broadly ovate, obtuse, hirsute, scarcely above 1 line long. Corolla-tube ovoid, inflated, contracted towards the throat, about $\frac{1}{2}$ in. long, the limb spreading, scarcely half as long as the tube. Capsule globular, glabrous about 3 lines diameter, 2-celled. Seeds 4, glabrous.—*Chois. in DC. Prod.* ix. 369; *Convolvulus urceolatus*, Spreng. Syst. i. 601.

Queensland. Endeavour river, *Banks and Solander*. The aspect, inflorescence, and flowers, are almost those of *Lepistemon flavescens*, Blume (which includes *L. Wallichii*, *Chois.*), but the scales at the base of the stamens surrounding the ovary of that species are wanting in the flower I dissected of *I. urceolata*, and are not mentioned in Brown's notes.

SERIES. 7. HYPOCRATERIFORMES.—Leaves entire or pinnatifid. Ovary 2-celled or 4-celled by pericarpal dissepiments between the 2 ovules of each

cell. Corolla with a cylindrical narrow tube and spreading nearly flat limb. Stamens and style usually exerted from the tube.

*38. **I. Quamoclit**, Linn. *Sp. Pl.* 227. A slender glabrous twiner. Leaves sessile, deeply pinnatifid, with linear-subulate entire segments. Peduncles longer than the leaves, bearing 1 to 3 scarlet flowers on long pedicels thickened upwards. Sepals obtuse, 2 to 3 lines long. Corolla-tube cylindrical, slender, $\frac{3}{4}$ to nearly 1 in. long; limb short, spreading, shortly 5-lobed. Stamens and style longer than the tube. Ovary 4-celled, with 1 ovule in each cell. Capsule ovoid-globular, glabrous, rather longer than the calyx, completely 4-celled. Seeds glabrous.—Bot. Mag. t. 244; *Quamoclit vulgaris*, Choisy. in DC. *Prod.* ix. 336.

Queensland. Rockhampton, *Sutherland*, said to be wild, but probably escaped from a garden or accidentally introduced. The species, believed to be of East Indian origin, has long been extensively cultivated for ornament in almost all warm civilized regions, and has established itself as a weed in the New as well as in the Old World.

3. CONVULVULUS, Linn.

(*Calystegia*, R. Br.; *Jacquemontia*, Choisy.)

Corolla campanulate, entire, angular or rarely lobed. Ovary 2-celled, with 2 ovules in each cell. Style filiform, with 2 ovate oblong linear or subulate stigmatic lobes. Fruit a dry capsule, completely or sometimes incompletely 2-celled.—Twining prostrate creeping or erect herbs, or in species not Australian undershrubs or low shrubs. Leaves entire or rarely toothed, lobed or deeply divided. Flowers axillary, solitary or in corymbose or umbel-like cymes. Seeds glabrous, at least in the Australian species.

A large genus, distributed over the whole area of the Order, less numerous within the tropics than *Ipomœa*, but extending far into the temperate and cooler regions both of the northern and the southern hemispheres. Of the six Australian species, two are spread over the extratropical regions of both hemispheres; two belong to the tropical Asiatic flora; the remaining two extend only to New Zealand.

Convolvulus has no character to distinguish it from *Ipomœa* besides the more or less elongated stigmatic lobes of the style, the habit is usually but not always different. For the subdivision of the genus, the largely developed bracts or bracteoles, and the imperfect development of the septum of the ovary, characters which in *Ipomœa* are scattered and isolated, are so far associated in the group *Calystegia* as to constitute a well-marked section, which however appears to me to be still too artificial to adopt it as a consistent Brown and others. The shortness of the stigmatic lobes, upon which Choisy had founded the genus *Jacquemontia* as intermediate between *Ipomœa* and *Convolvulus*, is not nearly so decided in the typical West Indian *Jacquemontias* as in *Convolvulus marginatus*.

SECT. I. Convolvulus.—Bracts small or none. Dissepiment of the ovary usually perfect.

- Flowers solitary or rarely 2 together. Sepals obtuse. Leaves either
 very narrow or toothed or lobed 1. *C. erubescens*.
 Flowers in cymes. Sepals acuminate. Leaves cordate, entire.
 Softly tomentose. Pedicels short 2. *C. multivalvis*.
 Glabrous or pubescent. Pedicels rather long 3. *C. parviflorus*.

SECT. II. Calystegia.—Bracts or bracteoles 2, enlarged and enclosing the calyx. Dissepiment of the ovary usually incomplete.

- Leaves hastate, acuminate. Bracteoles broadly cordate, almost orbicular. Calyx 2 lines; corolla $\frac{3}{4}$ in. long 4. *C. marginatus*.

Leaves cordate or hastate, acute or acuminate. Bracteoles ovate, acute, longer than the calyx. Sepals 4 to 5 lines; corolla above 2 in. long 5. *C. sepium*.
 Leaves fleshy, reniform or rounded-cordate, obtuse. Bracteoles ovate, very obtuse, shorter than the calyx. Sepals 4 to 6 lines; corolla about 1½ in. long 6. *C. Soldanella*.

SECT. I. CONVULVULUS.—Bracts small or none. Dissepiment of the ovary usually perfect.

1. *C. erubescens*, *Simes, Bot. Mag. t.* 1067. A perennial, either glabrous, pubescent or densely tomentose, rarely villous, with a creeping root-stock and slender prostrate trailing or rarely twining stems. Foliage exceedingly variable, the leaves usually more or less sagittate-cordate, the lower ones ovate-lanceolate, the upper ones passing into narrow-lanceolate or linear, with diverging entire or lobed basal auricles and from $\frac{3}{4}$ to 1½ in. long, but sometimes nearly all small, cordate-ovate obtuse and slightly crenate, sometimes nearly all narrow-linear with either very minute or long and linear basal auricles or lobes. Peduncles often as long as the leaves, 1-flowered, with minute bracts at a distance from the calyx. Sepals 2 to nearly 3 lines long, ovate, obtuse or almost acute. Corolla pink or white, usually from $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Ovary and fruit completely 2-celled. Stigmatic lobes linear.—*R. Br. Prod.* 482; *Chois. in DC. Prod.* ix. 412; *Hook. f. Fl. Tasm.* i. 275; *C. renatus*, *R. Br. Prod.* 483; *Chois. in DC. Prod.* ix. 412 (a small-leaved form); *C. angustissimus*, *R. Br. Prod.* 482 (very narrow-leaved specimens); *C. adscendens*, *De Vr. in Pl. Preiss.* i. 346; *C. subpinnatifidus*, *De Vr. l. c.* 347.

Queensland. Moreton Bay, *A. Cunningham*, and Nerook Creek, *Bowman* (both luxuriant specimens, with large leaves and sometimes 2 flowers on the peduncles); Rockhampton, *O'Shauesy*; Curriwillighi, *Barton* (both the common form).

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; northward to New England, *C. Stuart*, *C. Moore*, and Clarence river, *Beckler*; in the interior to Bathurst Plains, *A. Cunningham*, and to the Barrier Range, *Victorian and other Expeditions*.

Victoria. Very common in pastures, etc., from the Glenelg to Gipps' Land, *Adamsen*, *F. Mueller*, and others; Wimmera, *Dallachy*.

Tasmania. Near Ridsen Cove, *R. Brown* (very narrow-leaved specimens); abundant in good soil, *J. D. Hooker*.

S. Australia. Spencer's Gulf, *R. Brown* (very small-leaved specimens); from the Murray to St. Vincent's and Spencer's gulfs, *Behr*, *F. Mueller*, and others; Lake Torrens, *F. Mueller*; in the northern interior, *McDonall Stuart*.

W. Australia. Swan River, *Drummond*, *1st Coll. n.* 652, *3rd Coll. n.* 87, *4th Coll. n.* 164, *Preiss, n.* 1924, 1925; Murchison river, *Oldfield*.

Among the more remarkable forms or varieties are one with very small flowers from the Murray river, *F. Mueller*, and one with the leaves very densely tomentose and much-cut and crisped and the peduncles very short from Cudnuka, *F. Mueller*. The species is also in New Zealand, and appears to be the Australasian representative of the South African *C. hastatus* as well as of the *C. arensis* of the northern hemisphere. Besides the synonymus given above, and those quoted by *Choisy*, it should also probably include *C. acutalis*, *Chois. in DC. Prod.* ix. 406, and *C. Preissii* and *C. Hugelii*, *De Vr. in Pl. Preiss.* i. 346, all referred here by *F. Mueller*, but of which I have seen no specimens.

2. *C. multivalvis*, *R. Br. Prod.* 483. A twiner, closely allied to *C. parviflorus*, and considered by most authors as a variety, with the same cordate entire leaves and cymose inflorescence, but densely clothed with a

soft close tomentum or velvety pubescence, the peduncles shorter and the capsule longer and much more distinctly splitting into about 8 valves.

N. Australia. Rerent's River, N.W. coast, *A. Cunningham*, *Brown*, Gladly district, *Martin*.

Queensland. Keppel Bay, *R. Brown*; Howick's group, *F. Mueller*; Nerool Creek and Suttor river, *Bowman*.

Also on the S. coast of New Guinea.

3. ***C. parviflorus***, *Vahl*; *Chois. in DC. Prod.* ix. 413. A tall twiner, glabrous or slightly pubescent. Leaves on rather long petioles, cordate-ovate, acuminate, entire, membranous, 2 to 3 in. long. Peduncle about as long as the leaves, bearing a dense cyme of numerous small flowers. Bracts minute. Sepals ovate, acuminate, pubescent, 2 to 2½ lines long. Corolla very open, above ½ in. diameter. Stamens rather long. Stigmatic lobes linear-oblong, recurved, much shorter than in *C. erubescens*. Capsule small, completely 2-celled, opening in 4 valves, which are sometimes split but much less so than in *C. multivalvis*.—*C. multivalvis*, var. β , *R. Br. Prod.* 483.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*, *Hayes*; Escape Cliff, *Hulls*; Port Essington, *Armstrong*.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*, *Dallachy*, and others.

The species is widely dispersed over E. India and the eastern Archipelago. The flowers are usually described as white, but are said to be blue by Choisy, i.e., and prob. by *F. Mueller* (*Fragm.* vi. 99).

SECT. II. CALYSTEGIA.—Bracts or bracteoles 2, enlarged and enclosing the calyx. Dissepiment of the ovary usually incomplete.

4. ***C. marginatus***, *Spreng. Syst.* i. 603. A glabrous twiner. Leaves on rather long petioles, narrow-lanceolate or broad and triangular, hastate or sagittate, the basal auricles or lobes acute, diverging, and often lobed, the whole leaf usually 1½ to 2 in. long, but when luxuriant twice as large. Peduncles rarely exceeding the petiole. Bracts very broadly cordate-ovate, from scarcely longer than the calyx to twice as long. Sepals rarely above 3 lines long. Corolla about ¾ in. long. Ovary very imperfectly 2-celled. Stigmatic lobes ovate, obtuse. Capsule globular, 1-celled. Seeds 1.—*Calystegia marginata*, *R. Br. Prod.* 483; *Chois. in DC. Prod.* ix. 434; *Hook. f. Fl. N. Zeal.* t. 48.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart*; Clarence and Macleay rivers, *Beckler*.

Victoria. Snowy and Broadribb rivers, *F. Mueller*.

The species is also in Norfolk Island and in New Zealand. Some specimens have the aspect of some varieties of *C. erubescens*, but are at once distinguished by the large bracts.

5. ***C. sepium***, *Lin. Sp. Pl.* 218. A tall rather slender herbaceous twiner, quite glabrous or very slightly pubescent, with a creeping perennial rootstock. Leaves from broadly ovate-triangular to lanceolate-hastate, acutely acuminate, cordate with angular basal auricles or lobes, mostly 2 to 4 in. long but sometimes larger. Peduncles longer than the petioles and often 4½ long as the leaves, bearing a single large flower of a pure white or more or less

tinged with pink. Erect, large, ovate or ovate-lanceolate, leafy, acute or scarcely obtuse, longer than the calyx and enclosing it. Sepals ovate-lanceolate or lanceolate-acuminate, rather unequal, 4 to 5 lines long. Corolla 2 to 3 in. long. Ovary incompletely 2-celled, surrounded by a cup-shaped disk. Stigmatic lobes ovate or oblong, obtuse. Capsule 1-celled.—*Calystegia sepium*, R. Br. Prod. 483; Choisy in DC. Prod. ix. 433; De Vr. in Fl. Preiss. i. 345; Hook. f. Fl. Tasm. i. 276.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*.

Victoria. Wilson's Promontory and Merriman's Creek, *F. Mueller*; Emu Creek, *Wheat*; Wendu Vale along rivers and springs, *Robertson*; Melbourne, *Adamson*.

Tasmania. Port Dalrymple, *R. Brown*; abundant in several parts of the island, *J. D. Hooker*.

W. Australia. Swan River, *Trinchant*, n. 219; Port Leschenault, *Preiss*, n. 1926; Tone river, *Maxwell*; Murchison river, *Oldfield*.

The species is abundant in the temperate and subtropical regions of the northern hemisphere, and is also in New Zealand. When on the seacoast the lower leaves are sometimes thicker, shorter, and more obtuse, but appear to me to be always very different from those of *C. Soldanella*.

6. **C. Soldanella**, *Lima. Sp. Pl.* 226. A glabrous perennial with a creeping rootstock and prostrate trailing or shortly twining stems. Leaves on rather long petioles, broadly rounded-cordate or kidney-shaped, entire or angular-lobed, rather thick, mostly about 1 in. but sometimes 2 in. diameter. Peduncles 1-flowered, about as long as the leaves. Bracts broadly ovate-cordate, very obtuse, rather shorter than the calyx. Sepals nearly $\frac{1}{2}$ in. long, broad and thin, all very obtuse or the inner ones almost acute. Corolla pink or purplish, rather smaller than in *C. sepium*. Ovary incompletely 2-celled, surrounded by a cup-shaped disk. Stigmatic lobes ovate or oblong, usually narrower than in *C. sepium*, much shorter and broader than in *C. erubescens*. Capsule 1-celled.—*Calystegia Soldanella*, R. Br.; Choisy in DC. Prod. ix. 433; Hook. f. Fl. Tasm. i. 276; *C. reniformis*, R. Br. Prod. 484.

N. S. Wales. Seacoast, Port Jackson, *R. Brown*, *Sieber*, *Woolfs*; Illawarra, *A. Cunningham*.

Victoria. Wilson's Promontory, *F. Mueller* (the specimens not in flower, and therefore somewhat doubtful).

Tasmania. Seashore, Circular Head, *Gunn*.

The species is common on the extratropical seacoasts in both the northern and southern hemispheres both of the New and the Old World, including New Zealand where it varies much more than on the northern hemisphere. *F. Mueller* (Leym. vi. 100) reduces it to *C. sepium*, but those who are familiar with the two species, at least in our northern hemisphere, will scarcely agree to the union of forms so constantly distinct.

4. POLYMERIA, R. Br.

Corolla very broadly campanulate, entire or angular. Ovary 2-celled, with 1 ovule in each cell. Style filiform, with several (4 to 8) or very rarely only 2 linear stigmatic lobes. Fruit a dry capsule with 1 or 2 seeds.—Erect prostrate or trailing herbs, rarely twining. Leaves usually entire. Peduncles axillary, bearing 1 to 3 flowers. Bracts very small.

The genus is limited to Australia. Closely allied to *Convolvulus* in habit as well as in character, it differs in the ovules reduced to 2 (1 only in each cell of the ovary), whilst the

stigmatic lobes, in all the species except *P. distigma*, are increased in number, probably by their division. Several of the species here enumerated run much one into the other, and they might all well be reduced to two or three.

Leaves linear or lanceolate.

Leaves glabrous above, fringed with silky hairs. Flowers nearly 1 in.

long, the sepals very unequal 1. *P. marginata*.

Leaves silky or hoary or glabrous on both sides. Sepals nearly equal.

Stigmatic lobes 6 to 8.

Flowers about $\frac{3}{4}$ in. long. Stems usually erect 2. *P. longifolia*.

Flowers about $\frac{1}{2}$ in. long. Stems usually diffuse 3. *P. angusta*.

Stigmatic lobes 2. Stems erect. Peduncles 2-flowered 4. *P. distigma*.

Leaves cordate, ovate or oblong.

Outer sepals orbicular-cordate, inner ones narrow 5. *P. calycina*.

Sepals nearly equal.

Stem and leaves usually villous or pubescent. Sepals about 3 lines

long 6. *P. ambigua*.

Stem slender. Leaves small or linear, nearly glabrous. Sepals

about 2 lines long 7. *P. pusilla*.

1. ***P. marginata*, Benth.** Stems erect, under 1 ft. high, loosely hirsute. Lower leaves petiolate, oblong, obtuse, deeply cordate, under 2 in. long, upper ones nearly sessile, lanceolate or linear-lanceolate, acute, slightly cordate, 2 to 4 in. long, all glabrous on both sides, except a few hairs on the veins underneath, but the margins elegantly fringed with rather long hairs. Peduncles shorter than the leaves, 1-flowered, with linear bracts above the middle. Outer sepals broadly lanceolate, acute, 5 or even 6 lines long, the 2 innermost smaller and much narrower. Corolla nearly 1 in. long. Stigmatic lobes about 8.

Queensland. In the interior, *Mitchell*. This may possibly prove to be a very marked variety of *P. longifolia*, notwithstanding the differences in the indumentum and calyx and the large flowers.

2. ***P. longifolia*, Lindl. in Mitch. Trop. Austr. 398.** Stems from a perennial stock erect, slightly branched, usually about 1 ft. high or shorter, pubescent or villous as well as the foliage with appressed silky hairs. Leaves almost sessile, linear or linear-lanceolate, mucronate-acute, minutely hastate at the base, often above 2 in. long. Peduncles 1-flowered, shorter than the leaves. Sepals oval-oblong, more or less acuminate or acute, about 3 lines long, all nearly equal. Corolla pink, usually about $\frac{3}{4}$ in. long, but sometimes smaller. Stigmatic lobes usually 6, but sometimes 7 or 8.

Queensland. Near the Gwydir, *Mitchell*; plains of the Condamine, *Leichhardt*; Sattor, Isaacs, Bowen rivers, etc., *Borman*; Flinders river, *Sutherland*; Armadillo, *Barton*.

N. S. Wales? Between Darling river and Cooper's Creek, *Neilson* (referable perhaps to *P. angusta*).

The Queensland specimens include some with remarkably narrow-linear leaves and rather smaller flowers.

3. ***P. angusta*, F. Muell. Fragm. vi. 100 (partly).** A perennial apparently diffuse or prostrate, softly and densely silky-hairy, otherwise very near *P. longifolia* and perhaps a variety. Leaves mostly nearly sessile and lanceolate or linear, the lower ones more distinctly petiolate and cordate at the base, all silky on both sides. Flowers much smaller than in *P. longifolia*. Sepals

lanceolate, acute, $2\frac{1}{2}$ to 3 lines long, slightly unequal. Corolla apparently scarcely $\frac{1}{2}$ in. long. Style-branches 6 to 8.

N. Australia. Sturt's Creek, *F. Mueller*, and possibly also in **N. S. Wales**, between Darling river and Cooper's Creek, *Neilson*. F. Mueller included *P. longifolia* under his *P. angusta*, having accidentally overlooked Lindley's older name. I have ventured to retain F. Mueller's name for the N. Australian form, which at present appears to me distinct, although it is not unlikely that further specimens may show that it is a variety only. F. Mueller describes the ovary as 1-celled. In the flowers examined, I have always found a dissepiment between the 2 ovules in this as in all other species of the genus.

4. **P. distigma**, *Beath*. Stems erect, hoary-tomentose, with the stature and general aspect of some specimens of *P. longifolia*. Leaves linear, entire, narrowed into a short petiole, glabrous or nearly so. Peduncles slender, shorter than the leaves, mostly 2-flowered. Sepals ovate-lanceolate, acuminate-acute, nearly equal, about 3 lines long. Corolla fully $\frac{3}{4}$ in. long. Stigmatic lobes 2, linear-cuneate, obtuse.

N. Australia. Glenelg district, N.W. coast, *Martin*. This is evidently allied to *P. longifolia*, and has the 2-ovule ovary of the genus; but the style, as observed by F. Mueller as well as by myself, is that of *Convolvulus*.

5. **P. calycina**, *R. Br. Prod.* 488. A glabrous or slightly pubescent annual (or sometimes with a perennial creeping rootstock?). Stems slender, prostrate or creeping. Leaves on slender petioles, the lower ones ovate, obtuse or emarginate, deeply cordate, under 1 in. long, the upper ones oblong linear or lanceolate, obtuse, slightly cordate or rarely hastate at the base, often above 1 in. long. Peduncles slender, shorter than the leaves, 1-flowered, with minute bracts at or below the middle. Outer sepals very broadly ovate or cordate, about 3 lines long, the inner ones shorter, ovate-lanceolate or lanceolate, acuminate. Corolla 5 to 6 lines long, broadly campanulate, slightly silky-pubescent outside. Anthers rather long. Stigmatic lobes about 6. Capsule shorter than the calyx. Seeds pubescent or silky-villous in the specimens seen, glabrous according to R. Brown. — Choisy, in DC. Prod. ix. 432; Endl. Iconogr. t. 67.

Queensland. Kappel Bay, *R. Brown, Thwaites*; Rockhampton, *O'Shaughnessy*; Gracemere, *Bowman*; Moreton Bay, *C. Stuart*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others, Richmond river, *Favcott*.

Var. ? *molles*. The whole plant softly pubescent, the characters otherwise the same as in the Eastern form.

W. Australia. Port Walcott, *C. Harper (Herb. F. Muell.)*.

Some of the narrow-leaved Eastern specimens might very well, without close examination, be mistaken for some varieties of *Convolvulus crebescens*. The outer sepals, although variable in breadth, are, however, always broader than in the latter species, independently of the generic character.

6. **P. ambigua**, *R. Br. Prod.* 488. An annual (or sometimes perennial?), with long, slender, creeping or trailing stems, occasionally rooting at the lower nodes and sometimes shortly twining at the extremities. Leaves petiolate, ovate or oblong, obtuse, often mucronate, cordate at the base, usually rugose, glabrous, sparingly pubescent or rarely villous above, more or less villous or silky-hairy underneath, mostly about 1 in. long, but variable in size. Pe-

peduncles usually longer than the petioles, bearing 1 to 3 flowers with minute bracts at the base of the pedicels, and usually 2 small bracteoles on the pedicels. Sepals nearly equal, acuminate, about 3 lines long. Corolla not twice as long, very open. Stigmatic branches 4 to 6. Capsule nearly as long as the calyx. Seeds glabrous or very minutely hoary-pubescent.—Choisy, in DC. Prod. ix. 432.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria river and Sturt's Creek, *F. Mueller*.

Queensland. Thirsty Sound, *R. Brown*.

P. lanata, *R. Br.* l. c. and Choisy, l. c., from the same N. Australian localities, appears to be a very densely silky-villous variety, the leaves much smaller, broad in *R. Brown*'s specimens, narrow in *F. Mueller*'s, the flowers rather smaller, mostly solitary.

P. quadrivalvis, *R. Br.* l. c. and Choisy, l. c. (the above-quoted specimens from Thirsty Sound, *R. Brown*), appears to me to be another variety, nearly glabrous, with rather small solitary flowers, connecting *P. ambigua* with *P. pusilla*.

7. *P. pusilla*, *R. Br. Prod.* 488. This may be another small slender form of *P. ambigua*, glabrous or slightly pubescent. Stems almost filiform, prostrate or twining. Leaves on slender petioles, from cordate-ovate obtuse or retuse and under 1 in. long, to linear and then entire or hastate at the base. Peduncles 1-flowered, with minute bracts at a distance from the flower. Sepals nearly equal, lanceolate, acuminate, about 2 lines long. Corolla about twice as long, very open. Stigmatic branches usually 4.—Choisy, in DC. Prod. ix. 432.

Queensland. Broad Sound, *R. Brown*, also from *Bacmeister*'s collection, with short ovate leaves as in *Brown*'s specimens; Rockhampton, *O. Schumacher*, and Keppel Bay and Fitzroy river, *Thozet*, with linear leaves. Possibly the small-flowered nearly glabrous variety referred above to *P. ambigua* (*P. quadrivalvis*, *R. Br.*) may be rather a form of *P. pusilla*.

5. PORANA, Linn.

(*Duperreya*, *Gaudich.*)

Sepals much enlarged after flowering, and horizontally spreading under the fruit. Corolla campanulate or tubular-campanulate, angular or 5-lobed, folded in the bud. Ovary 1-celled, with 2 or 4 ovules; style entire or bifid; stigma globular, single or 1 on each branch. Capsule usually 1-seeded by abortion, indehiscent (or 2-valved?).—Tall twiners, often woody at the base. Leaves entire. Flowers usually small, axillary and solitary in the Australian species, paniculate in the Indian ones. Bracts small.

The genus extends over tropical Africa and Asia to the Indian Archipelago. The only Australian species is endemic and extratropical; and, although possessing the essential characters of the Asiatic ones, is very different in foliage and inflorescence. The remarkable fruiting calyx distinguishes this from all other Convolvulaceous genera.

1. *P. sericea*, *F. Muell. Fragm.* vi. 100. A tall but slender twiner, shrubby at the base, the branches and foliage silky-pubescent. Leaves very shortly petiolate, linear or linear lanceolate, obtuse or scarcely acute, 1 to 1½ in. long. Peduncles axillary, 1-flowered, shorter than the leaves, with 2 small bracts or bracteoles close under the calyx. Sepals broadly ovate, obtuse, silky-pubescent, 2 to 2½ lines long at the time of flowering. Corolla very open, not twice as long as the calyx, said by some to be blue, by others



Myrica brevifolia, F. & M.

pale pink. Ovary 1-celled, with 2 ovules; style undivided, with a large globular stigma. Fruiting sepals broadly ovate, rigidly scarious, elegantly veined, $\frac{3}{4}$ in. long or even more. Capsule small, ovoid or oblong, membranous, indehiscant, 1-seeded.—*Duperreya sericea*, Gaudich. in Frey. Voy. Bot. 452. t. 63; Choisy in DC. Prod. ix. 436; *Ipomœa modesta*, F. Muell. Fragm. ii. 22.

W. Australia. Between Moore and Murchison rivers, *Dreamond*, 6th Coll. n. 223; Blackwood and Murchison rivers, *Oldfield*.

6. BREWERIA, R. Br.

(*Prevostea*, Choisy.; *Seddera*, Hochst. and Steud.; *Stylisma*, Nutt.)

Corolla campanulate, angular or shortly and broadly 5-lobed, folded in the bud. Ovary 2-celled, with 2 ovules in each cell. Style bifid or divided to the base, with a capitate stigma to each branch. Fruit a dry capsule.—Herbs or undershrubs, with erect prostrate trailing or twining stems, often tomentose or silky. Leaves usually entire. Flowers axillary, solitary or rarely 2 or 3 together in the Australian species, the upper ones often forming a leafy spike, or in extra-Australian species the peduncles often several-flowered.

The genus, as at present constituted, includes several species from tropical Asia, Africa, and America, but the Australian ones appear to be all end-mic. The habit is often that of some species of *Convolvulus*, but the style is very different. A. Gray (Proc. Amer. Acad. v. 336), relying only upon the characters given by R. Brown and by Choisy, thought that *Breweria* could not be separated from *Bouamnia*, Thon.; the study, however, of Thonars' detailed description and figure (in the absence of authentic specimens) shows that the latter has neither the inflorescence nor probably the aestivation of the corolla nor the fruit of *Convolvulaceæ*, but appears to be more closely allied to *Ehretia* and *Cordia*, with the style of the former and the embryo of the latter. A. Gray appears, however, to be quite right in uniting *Stylisma*, Nutt., with *Breweria*; nor can I distinguish the African *Seddera*, Hochst., nor yet the tropical American *Defforeia*, H. B. and K., or *Prevostea*, Choisy, for the sole character given for the latter, the enlarged outer sepals, occurs in a very marked way in *B. pannosa*, and to a slight degree in several other species.

Silky-pubescent or shortly hirsute. Bracteoles minute.

Leaves linear or lanceolate 1. *B. linearis*.

Lower leaves somewhat cordate, upper ones lanceolate 2. *B. media*.

All the leaves regularly heart-shaped 3. *B. brevifolia*.

Densely rusty-tomentose or villous with long hairs. Bracteoles at least as long as the calyx.

Sepals slightly unequal. Corolla pink, about 1 in. long 4. *B. rosea*.

Outer sepals much larger than the inner. Corolla (blue) under $\frac{1}{2}$ in. long 5. *B. pannosa*.

1. **B. linearis**, R. Br. Prod. 188. Silky-pubescent or hirsute. Stems prostrate or shortly twining. Leaves very shortly petiolate, oblong, linear or narrow-lanceolate, mostly obtuse and about 1 in. long. Peduncles 1-flowered, about half as long as the leaves or sometimes very short, with minute bracts at the base sometimes scarcely perceptible. Sepals lanceolate, acuminate, about 3 lines long, the innermost rather smaller. Corolla apparently small, but not seen perfect. Style in the specimens examined divided to about the middle.—Choisy in DC. Prod. ix. 439.

N. Australia. Islands of the Gulf of Carpentaria, R. Brown; Upper Victoria river, F. Mueller; mainland, Carpentaria, *Lansborough*.

2. **B. media**, *R. Br. Prod.* 488. Pubescent or somewhat silky-hairy. Stems prostrate. Leaves shortly petiolate, the lower ones ovate-oblong or ovate-lanceolate, obtuse or acute and often somewhat cordate at the base, the upper ones lanceolate, acute, rarely above 1 in. long. Peduncles 1-flowered, short, with small bracts at the base. Sepals ovate-lanceolate, subulate-acuminate, slightly unequal, 2 to 3 lines long. Corolla (white?) under $\frac{1}{2}$ in. long. Ovary hirsute at the top with long hairs. Styles cohering to the middle, but readily separable to the base.—*Chois.* in *DC. Prod.* ix. 438.

N. Australia. S. Arnhem Bay, *R. Brown*; Victoria river, *F. Mueller*.

Queensland. Bowen river, *Bowman*.

N. S. Wales. Between Darling river and Cooper's Creek, *Neilson*.

Var. ? *parviflora*. Stems very slender. Leaves more cordate. Flowers smaller.—Victoria river, *F. Mueller*.

Var. ? *villosa*. Much more villous. Flowers small.—Victoria river, *F. Mueller* (the specimens very imperfect).

The circumscription of this species and of *B. linearis* and *B. brevifolia* may require considerable modification when a more complete series of specimens shall be obtained.

3. **B. brevifolia**, *Benth.* A perennial, with a thick and hard stock and long, slender, prostrate, pubescent stems. Leaves on short petioles, ovate-cordate, acute or the lower ones rounded and more obtuse, rarely above $\frac{1}{2}$ in. long, glabrous above, more or less hairy underneath. Peduncles 1-flowered, shorter than the calyx, with minute bracts usually at the base. Sepals lanceolate, acutely-acuminate, hirsute, about $2\frac{1}{2}$ lines long, slightly unequal. Corolla about twice as long as the calyx. Ovary hirsute with long hairs. Style divided to about the middle.

N. Australia. Port Essington, *Armstrong*.

4. **B. rosea**, *F. Muell. Fragm.* i. 233. An undershrub or shrub of 1 to 2 or even 3 ft., densely tomentose or hirsute with ferruginous hairs, especially on the upper leaves and calyxes. Leaves nearly or quite sessile, ovate obovate or orbicular, mostly obtuse, thick and soft as in *B. pannosa*. Flowers pink (*Oldfield*), solitary in the axils, nearly sessile, larger than in *B. pannosa*, the upper one forming a leafy terminal spike with the uppermost floral leaves very small. Sepals lanceolate, 3 to 4 lines long, the inner ones rather narrower than the outer. Corolla-tube broad but almost cylindrical, fully $\frac{1}{2}$ in. long, the limb broad, spreading to $\frac{3}{4}$ in. diameter. Ovary hirsute with long hairs. Styles free from the base.

N. Australia. Hammersley Range, N.W. Coast, *M. Brown*.

W. Australia. Murchison river, *Oldfield*.

5. **B. pannosa**, *R. Br. Prod.* 488. Stems from a perennial stock, prostrate or twining, the whole plant densely hirsute with soft ferruginous or silky hairs. Leaves on very short petioles, ovate and acute or the lower ones orbicular and obtuse, thick and soft, under 1 in. long. Flowers blue (*R. Brown*), solitary in the axils or rarely 2 or 3 together, on short pedicels, with a pair of linear bracts about the middle. Sepals very hirsute like the rest of the plant, the outer ones broadly ovate, acuminate, 4 to 5 lines long, the inner ones much smaller, and the innermost one linear-lanceolate. Co-

roila above $\frac{1}{2}$ in. long, hairy outside. Ovary hirsute at the top with long hairs. Style divided to about the middle. — *Chois. in DC. Prod. ix. 438.*

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria river, *F. Mueller* (very densely hirsute); Port Essington, *Armstrong* (the hairs rather shorter).

7. CRESSA, Linn.

Corolla tubular-campanulate; lobes 5, contorted (or otherwise imbricate?) in the bud, not plicate. Ovary 2-celled, with 2 ovules in each cell; styles 2, distinct from the base, each with a capitate stigma. Capsule usually 2-valved and 1-seeded by abortion. A small branching perennial. Leaves entire. Flowers small, in terminal leafy spikes or heads.

The genus is limited to a single species, common to the warmer regions of the New as well as the Old World.

1. **C. cretica**, Linn.; *Chois. in DC. Prod. ix. 440.* An erect or diffuse, much-branched perennial, sometimes almost woody at the base, rarely exceeding 6 in., hoary silky-pubescent or villous all over. Leaves sessile or the lower ones shortly petiolate, ovate-lanceolate, or in specimens not Australian linear, entire, rarely exceeding $\frac{1}{4}$ in. Flowers sessile in terminal leafy spikes or heads, rarely reduced to a single flower. Sepals broadly obovate, very obtuse, ciliate, about 2 lines long. Corolla very shortly exceeding the calyx, hairy outside. Anthers large, oblong. Ovary villous. Capsule ovoid, exceeding the calyx, rarely ripening more than one smooth seed. — *C. australis*, *R. Br. Prod. 490.*

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; mouth of the Victoria river, *F. Mueller*; Albert river, *Henne*.

Queensland. Broad Sound, *R. Brown*; Sandy Flats, Port Denison, *W. Hall*.

N. S. Wales. Murray and Darling deserts, *Victorian Expedition*.

S. Australia. Subsaline pastures, Murray river to St. Vincent's Gulf, *F. Mueller*.

W. Australia, *Drummond, n. 131.*

The species is abundantly spread over sandy maritime or saline districts in the warmer regions of the Old and New World, extending to the Mediterranean region of Europe. The flowers in some of the tropical Australian specimens are larger than usual, but not otherwise different.

8. EVOLVULUS, Linn.

Corolla campanulate or tubular at the base, the limb 5-angled or 5-lobed. Ovary 2-celled, with 2 ovules in each cell. Styles 2, filiform, distinct from the base, each divided into 2 branches; stigmas linear, terminating each branch. Fruit a capsule, with 4 seeds or fewer by abortion. — Herbs, not twining, annual or with a short perennial stock. Leaves entire, usually small. Flowers small, on axillary peduncles or in terminal spikes or racemes.

A considerable tropical American genus, of which one or two species are spread also over the warmer regions of the Old World. The only Australian species is the one most common over the whole area.

1. **E. alsinoides**, Linn.; *Chois. in DC. Prod. ix. 447.* A perennial, with a short almost woody stock, but often flowering the first year so as to appear annual, with numerous slender prostrate or erect stems, 6 in. to 1 ft. long, the whole plant more or less silky-hairy. Leaves usually oblong or lanceolate, ses-

sile or nearly so, 3 to 6 lines long, but varying from ovate to almost linear, obtuse or acute. Flowers small, pale blue or white, 1 to 3 together on slender axillary peduncles mostly longer than the leaves, but the lower ones sometimes shorter and the upper ones often long and filiform, forming a loose terminal leafy raceme or narrow panicle. Bracts small under each pedicel. Sepals narrow, acute. Corolla pale blue and white or entirely of one of these colours, very open or almost rotate, about 3 lines diameter.—R. Br. Prod. 489; *E. linifolius*, Linn.; R. Br. Prod. 489; Chois. in DC. Prod. ix. 449; *E. decumbens*, R. Br. Prod. 489; *E. villosus*, R. Br. Prod. 489, but perhaps not of Ruiz and Pav.: *E. heterophyllus*, Labill. Ser. Austr. Calcd. t. 29; Chois. in DC. Prod. ix. 449, and probably some others enumerated by Choisy; *E. pilosus*, Roxb. Fl. Ind. ii. 106.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; N.W. coast, *Bynoe, Gregory's Expedition*, etc.; Victoria river and Arnhem's Land, *F. Mueller*; Port Essington, *Armstrong, A. Cunningham*; in the interior, *McDonall Stuart's Expedition*.

Queensland. Abundant along the whole coast, *R. Brown* and many others; and in the interior, *Mitchell, Bowen*, and others.

N. S. Wales. Clarence river, *Beckler*; New England, *C. Stuart*; from Darling river to Cooper's Creek, *Victorian and other Expeditions*.

S. Australia. Cooper's Creek, *Howitt's Expedition*.

W. Australia. Port Walcott, *C. Harper* (the following variety only).

Var. sericeus. Leaves thicker and very white, with long silky hairs.—*E. argenteus*, R. Br. Prod. 489, not of Pursh. Islands of the Gulf of Carpentaria, *R. Brown*; Port Walcott, *C. Harper*.

Linnaeus originally distinguished the broad, obtuse-leaved form as an Asiatic, and the narrow acute-leaved as an American species, and since both have been found to be abundant in both the New and the Old World, the distinction has been kept up by Choisy, Grisebach, and others; but the two run so much one into the other that it has appeared to me impossible to separate them in any long series of specimens. Many have the lower leaves of the one and the upper ones of the other, and often the difference appears to arise from soil and station. I had accordingly in the 'Niger Flora,' as well as in the 'Flora Hongkongensis,' proposed to unite the two under the name of *E. alsinoides*; F. Mueller also unites them, but prefers the other Linnæan name of *E. linifolius*. Amongst other supposed Asiatic species, *E. angustifolius*, Roxb. Fl. Ind. ii. 107, and *E. gracillimus*, Miq. Fl. Ind. Bat. ii. 629, appears to be a very narrow-leaved state which also occurs in Australia, the African synonyms have been already given by Choisy, and to these ought probably to be added several American ones requiring further investigation. *E. villosus*, Ruiz and Pavon, appears however to differ in its flowers much larger than in Brown's specimens.

9. DICHONDRA, Forst.

Corolla campanulate, deeply 5-lobed. Ovary of 2 distinct carpels, each with an almost basal style and 1 or 2 ovules; stigmas capitate. Fruit of 1 or 2 membranous capsules, each with 1 or rarely 2 seeds.—Prostrate creeping small herbs. Leaves entire. Flowers small, axillary.

Besides the Australian species, which is widely spread over the warmer regions of the New as well as the Old World, there is another closely allied to it from Central America.

1. **D. repens**, Forst.; Chois. in DC. Prod. ix. 451. A slender creeping perennial, rooting at the nodes, usually hoary with a minute pubescence, often silky. Leaves on long petioles, orbicular or reniform, 4 to 8 lines or rarely 1 in. diameter. Flowers solitary, on peduncles shorter than the

petioles. Sepals obovate, scarcely 1 line long. Corolla rather shorter than the calyx, yellow. Carpels also shorter than or rarely as long as the calyx, nearly globular.—R. Br. Prod. 491; Hook. f. Fl. Tasm. i. 278; Sm. Ic. Ined. t. 8.

N. Australia. Port Essington, *Armstrong*.

Queensland. Moreton Bay, *F. Mueller*; Rockhampton, *O'Shaughy*.

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Miss Atkinson*.

Victoria. Port Phillip, *R. Brown*; Wendu vale, *Robertson*; Yarra river, *F. Mueller*, *Adamson*; Ballarook forest, *Whan*.

Tasmania. Abundant in many parts of the island, *J. D. Hooker*.

S. Australia. Around St. Vincent's Gulf, *F. Mueller*, *Behr*.

W. Australia. Cape le Grand, *R. Brown*; Vasse river, *Oldfield*; also in *Drummond's* collections, n. 86 and 163.

The species is generally diffused over the tropical regions of both the New and the Old World, especially near the sea, extending northward to the southern United States and to China, and southward to the Cape of Good Hope, extratropical S. America and New Zealand.

10. WILSONIA, R. Br.

Sepals united in a tubular-campanulate shortly 5-lobed or 5-toothed calyx. Corolla with a slender tube and campanulate 5-lobed limb, the lobes imbricate in the bud but with induplicate margins. Ovary 2-celled or almost 1-celled with 1 erect ovule in each cell (or rarely 2?). Style divided into 2 filiform branches with capitate stigmas. Fruit a capsule with 1 or 2 seeds.—Prostrate much-branched perennials or undershrubs. Leaves entire, small. Flowers axillary, sessile or nearly so. Bracts none.

The genus is limited to Australia, and almost to the southern shores or to the saline tracts in the interior.

More or less hairy. Leaves lanceolate ovate or orbicular, rarely above 2 lines long.

Silky-pubescent. Leaves very concave, usually distichously imbricate on the branchlets 1. *W. humilis*.

Loosely hairy. Leaves flat, not imbricate 2. *W. rotundifolia*.

Glabrous. Leaves linear, 3 to 6 lines long 3. *W. Backhousei*.

1. **W. humilis**, R. Br. Prod. 490. A prostrate much-branched undershrub or shrub, hoary all over with silky hairs, the stems spreading to from 6 in. to 1 ft. Leaves crowded, imbricate on the smaller branchlets and usually distichous, sessile, ovate or lanceolate, thick, very concave, from under 1 line to nearly 2 lines long. Flowers sessile and solitary. Calyx silky-hairy, nearly 2 lines long, the teeth or lobes shorter than the tube. Corolla-tube nearly as long as the calyx; lobes shorter than the tube, spreading. Anthers ovoid or oblong, scarcely exerted. Ovary 1-celled at the base, but often, if not always, 2-celled at the top. Capsule shorter than the calyx, membranous, usually 1-seeded.—Chois. in DC. Prod. ix. 150; Lehm. Pl. Preiss. ii. 237; Hook. f. Fl. Tasm. i. 277; F. Muell. Fragn. vi. 101; *Frankenia cymbifolia* (afterwards corrected to *W. humilis*), Hook. Ic. Pl. t. 265.

Victoria. Port Phillip, *R. Brown*; salt marshes near Melbourne, *Adamson* and others; Queenscliff, Station Peak, and salt plains near Mount Abrupt, *F. Mueller*.

Tasmania. Great Swan Port, *Backhouse*.

S. Australia. Port Adelaide, *Blandowski*; Spencer's Gulf, *Warburton*.

W. Australia. King George's Sound, *R. Brown, Harvey*; Phillips and Fitzgerald Ranges, *Maxwell*; Arthur's Head and Gordon river, *Preiss*, *n.* 2391, 2392, also *Drummond*, *n.* 106, 138, 220.

Var. *spinescens*, F. Muell. More shrubby with divaricate branches, the smaller ones spinescent.—W. Australia, *Drummond*, *n.* 82.

2. **W. rotundifolia**, *Hook. Ic. Pl. t.* 419. Stems from a perennial stock, prostrate or diffuse and much-branched, but shorter than in *W. humilis*, and not woody, the whole plant more or less hirsute with rather long hairs, not silky, and sometimes nearly glabrous. Leaves rather crowded but not imbricate, orbicular or ovate, contracted at the base or almost petiolate, thick but flat, rarely exceeding 2 lines. Flowers of *W. humilis* or rather larger, the corolla-tube slender, sometimes but not always quite as long as the calyx, and the stamens and styles rather more exerted. Ovary either completely 2-celled or the dissepiment incomplete at the base. Ovules 1 or, according to Hooker, sometimes 2 in each cell. Seeds 1 or 2 in the capsule. — (Chois. in DC. Prod. ix. 450; F. Muell. Fragm. vi. 101.

Victoria. Near Melbourne, *Adamsen*; Port Phillip, Station Peak, Lake Omeo and Murray river, *F. Mueller*; Skipton and Warragan (salt) lake, *Whan*; Wimmera, *Dallachy*.

S. Australia. Holdfast Bay and Kaiserstuhl, *F. Mueller*.

W. Australia. *Drummond*, *n.* 18, 657, and 335 (the latter specimens more glabrous).

3. **W. Backhouseii**, *Hook. f. in Hook. Lond. Jour.* vi. 275, and *Pl. Tas.* i. 277. Stems from a perennial stock, prostrate or diffuse with stout ascending branches, the whole plant quite glabrous and rarely extending to more than 6 in. Leaves linear or rarely narrow-oblong, acute or obtuse, flat but thick or almost terete, $\frac{1}{4}$ to $\frac{1}{2}$ in. long. Calyx glabrous, from under 3 to nearly 4 lines long, the teeth much shorter than the tube. Corolla-tube more slender than in the two preceding species and usually exceeding the calyx. Stamens and style also more exerted than in either of the others, and the anthers narrower. Ovary 2-celled from the bottom. — F. Muell. Fragm. vi. 101.

Victoria. Near Melbourne, *Adamsen*; Port Phillip, Lake Wellington, and near Brighton, *F. Mueller*; Wimmera, *Dallachy*; also in *R. Brown's* collection, without any label, probably from Port Phillip.

Tasmania. Kelyedon, Great Swan Port, *Story, Backhouse*.

W. Australia. Middle Mount Barron, *Maxwell*; Port Gregory, *Oldfield*.

11. CUSCUTA, Linn.

Sepals distinct or united in a 5-lobed rarely 4-lobed calyx. Corolla campanulate, ovoid or globular, with a short 5-lobed or rarely 4-lobed limb. Anthers usually nearly sessile, with a scale below each in the tube of the corolla. Ovary completely or partially 2-celled, with 2 ovules in each cell. Styles 2, distinct or more or less united; stigmas capitate or acute. Fruit a dry or scarcely succulent capsule, opening transversely or bursting irregularly. Embryo spiral or curved round a fleshy albumen; cotyledons inconspicuous. — Herbs, with leafless thread-like parasitical stems, bearing usually sessile clusters of small sessile or pedicellate flowers, white or pink.

A considerable genus, dispersed over all warm and temperate regions of the globe. Of the three Australian species, one has a very wide range both in the New and the Old World; another is limited to tropical Asia; the third appears to be endemic; but, notwithstanding the carefully elaborated monographs of Engelm., there is still much doubt as to the characters by which the species are to be distinguished. The Australian ones have all of them the sepals united at the base, and distinct styles with capitate stigmas. They have also the very slender filiform stems of *C. epithymæ* and its allies, not the firmer ones of *C. serotina* and others.

Flowers sessile or very shortly pedicellate in globular clusters.

Calyx-lobes prominently keeled 1. *C. chinensis*.

Calyx-lobes not keeled 2. *C. australis*.

Flowers on pedicels of 3 to 5 lines. Corolla campanulate 3. *C. tasmanica*.

1. ***C. chinensis***, Lam.; Engelm. in Trans. Acad. St. Louis, i. 479. Flowers rather small, nearly globular, very shortly pedicellate in globular clusters, sometimes reduced to 2 or 3 flowers and not usually so dense as in *C. australis*. Calyx shorter than the corolla, divided to the middle or rather lower into obtuse lobes, the keels and sutures of the sepals forming 10 rather prominent ribs to the tube. Corolla 1 to 1½ lines long, the lobes rather obtuse. Scales of the tube deeply fringed or lobed. Styles distinct, unequal, rather slender, with capitate stigmas. Capsule bursting irregularly. — *C. carinata*, R. Br. Prod. 191.

Queensland. Bay of Islands and Cape Grafton, Baily and Schimper (Herb. Mus. B. & A.). Apparently common in tropical Asia, extending from Madagascar and Ceylon to China.

2. ***C. australis***, R. Br. Prod. 191. Flowers nearly globular, sessile or very shortly pedicellate, in globular clusters, sometimes reduced to two or three flowers, each about 1½ lines diameter, and all the parts minutely glandular-dotted. Calyx shorter than the corolla, divided to below the middle into obtuse lobes, without prominent ribs. Corolla-lobes very obtuse, at length recurved. Scales of the tube bifid or fringed, sometimes very small but often nearly as long as the tube. Ovary much depressed; styles distinct, rather thick, unequal, with capitate stigmas. Capsule depressed, with a broad rhomboidal area between the styles. — *C. obtusiflora*, H. B. and K.; Engelm. in Trans. Acad. St. Louis, i. 491.

Queensland. Broad Sound, R. Brown.

N. S. Wales. M'Leay and Clarence rivers, Beckler; Bent's Basin, W. & S.

Victoria. Snowy, Goulburn, and King rivers, F. Mueller.

The species is widely dispersed over the warmer parts of America and Asia, extending northwards to the southern United States and to S. Europe.

3. ***C. tasmanica***, Engelm. in Trans. Acad. St. Louis, i. 512. Pedicels clustered, much longer than the flowers, usually about 4 or even 5 lines long, with minute bracts at their base. Calyx much shorter than the corolla, deeply divided into obtuse lobes, not prominently ribbed. Corolla campanulate, not contracted at the throat, above 1½ lines long, the lobes obtuse, as long as the tube. Scales of the tube large, deeply fringed. Styles distinct, rather long, nearly equal, with large obscurely-lobed capitate stigmas. Capsule short. Seeds with a small hilum. — *C. australis*, Hook. f. Fl. Tasman. i. 278, not of R. Br.

Victoria. Port Phillip, F. Mueller, who believes it to be introduced.

Tasmania. Near Hobarton and at George Town, *Gunn*.

This appears to me as to Engelmann a very distinct species, but the sectional character derived by Engelmann from the deeply-lobed concave stigma seems to have been an exceptionally abnormal state in the flower examined. In other flowers I find the stigma larger than in most species, but not very distinctly lobed.

ORDER LXXXII. SOLANÆÆ.

Flowers regular or nearly so. Calyx free, usually with 5, rarely with 4, 6 or 10 teeth lobes or segments. Corolla with 5 or rarely with 4 teeth or lobes, induplicate-plicate or rarely imbricate in the bud. Stamens as many as lobes of the corolla and alternate with them; anthers various, usually 2-celled. Ovary superior, 2-celled or rarely spuriously 4-celled or abnormally 3- or more-celled; style simple, terminal, with an entire or lobed stigma. Fruit an indehiscent berry or rarely a capsule, with several seeds. Embryo usually curved or spiral, surrounding a fleshy albumen, rarely straight in the centre of the albumen.—Herbs shrubs or soft-wooded trees. Leaves alternate, without stipules. Flowers solitary or in centrifugal cymes or unilateral racemes, usually at first terminal but becoming lateral by the elongation of the shoot, rarely axillary, the cymes or racemes usually without bracts, and no bracteoles on the pedicels.

A numerous Order in the tropical and warmer regions of the globe, and more especially S. America, with a comparatively few species straying into more temperate districts both in the northern and the southern hemisphere. Of the seven genera here enumerated, four have nearly the range of the Order; one is a tropical weed spread from America; one has a single Australian representative of an otherwise S. American genus; and one only is endemic. The Order is closely connected with Scrophularinæ, being technically separated by the more regular flower, with the stamens and corolla isomerous. On the other hand, it is allied to Hydrophyllaceæ through *Hydrolea*, which differs chiefly in its divided style and small embryo; and yet nearer to Polemoniaceæ, an Order scarcely distinguished from Solanæ except by the almost constant triacarpellary ovary and contorted aestivation of the corolla; it is unrepresented in Australia, excepting occasionally by a N.W. American *Colomia* or other annual escaped from a garden.

Fruit an indehiscent berry.

Corolla rotate or campanulate, folded in the bud.

Calyx, if enlarged after flowering, not inflated. Corolla rotate or very open. Anthers opening in terminal pores or slits . . . 1. SOLANUM.

Calyx inflated over the fruit. Corolla campanulate. Anthers opening in longitudinal slits.

Calyx 5-parted, cordate at the base 2. NICANDRA.

Calyx shortly 5-lobed 3. PHYSALIS.

Corolla contracted into a tube at the base, the lobes imbricate in the bud 4. LYCIUM.

Fruit capsular, opening in valves. Corolla folded in the bud or with induplicate lobes.

Corolla (small) broadly campanulate. Anthers 1-celled . . . 5. ANTHOTROCHE.

Corolla with a cylindrical or funnel-shaped tube.

Calyx tubular, circumsciss after flowering, leaving a broad persistent base. Corolla large. Capsule prickly 6. DATURA.

Calyx entirely persistent. Capsule smooth 7. NICOTIANA.

1. SOLANUM, Linn.

Calyx with 5, rarely with 4 or more than 5 teeth or lobes. Corolla rotate or very broadly campanulate, with 5 or rarely 4 angles or lobes, folded in

the bud. Filaments usually very short, rarely as long as the anthers; anthers oblong or linear, erect and connivent, either parallel or more frequently tapering upwards and forming a cone round the style, opening at the top in pores or transverse slits, rarely continued down the sides of the anthers, without any prominent connectivum between the cells. Fruit a berry, usually 2-celled rarely 4-celled (the cells divided by a spurious dissepiment) or in species or varieties not Australian several-celled. Seeds several, flattened, with a curved or spiral embryo surrounding a fleshy albumen.—Herbs shrubs or rarely low soft-wooded trees, either unarmed or with prickles scattered on the branches, on the principal veins of the leaves, especially on the upper surface and in some species also on the inflorescence and calyxes, straight and slender in most Australian species, stout and recurved in some others. Leaves alternate, but often in pairs, a smaller one being developed in the axil of the larger one, entire or irregularly toothed lobed or divided. Flowers normally in terminal centrifugal cymes; but, owing to the rapid development of the branch, the inflorescence becomes usually lateral and very often, by the abortion of one branch, reduced to a simple unilateral apparently centripetal raceme or to a single flower. Corolla usually blue purplish or white or in species not Australian yellow, always tomentose outside in the species where the tomentum is stellate, but usually only on the part exposed in the bud, with the induplicate margins glabrous. Style frequently curved to one side, the stigma slightly dilated, entire or 2-lobed.

A very large genus, spread over the warmer and temperate regions of the globe, but most abundant in tropical America. Besides the introduced species, there are forty-eight described below, of which one is a common weed over the whole range of the Order; another is spread over the tropical regions of the Old as well as the New World; one extends only to New Zealand; another to Timor; and a third only to the islands of the South Pacific; the remaining forty-three are endemic, belonging chiefly to groups sparingly or not at all represented in S. America; and *S. indicum* and other species with short stout prickles, so common in tropical Asia, have not as yet been detected in Australia.

The distinction and determination of the numerous species of this genus (most extravagantly multiplied by Dunal in the 'Prodromus') is attended with peculiar difficulties, the chief characters being derived from the very variable ones of foliage, armature and indumentum. The sections proposed by Sendtner, Dunal, and others break down in several instances, and are scarcely applicable to the Australian species. The three first here enumerated have a marked difference in the anthers, but there are extra-Australian intermediates; the differences in the form of the corolla, often very difficult to ascertain from dried specimens, are seldom in relation to other characters; and the form and colour of the fruit varies in a remarkable degree in some individual species. It, therefore, in the following key I have founded the principal groups or series chiefly upon indumentum and armature, it is not that I regard them as good sections, but only because I have as yet found no better way of leading to the determination of the Australian species.

§ 1. *No prickles. Whole plant glabrous or pubescent with simple hairs (not stellate).*

Anthers very obtuse, parallel, the terminal slits continued more or less down the sides.

Annual. Leaves ovate on long petioles. Flowers very small, in pedunculate umbels

1. *S. nigrum.*

Perennials or shrubs. Leaves lanceolate or linear, entire or pinnatifid. Flowers in short lateral loose racemes.

Leaves mostly acute, the longer ones with a few long lobes. Flowers large. Berries green or yellow

2. *S. aviculare.*

Leaves mostly obtuse, very rarely and shortly lobed. Flowers moderate. Berries purple

3. *S. simile.*

Anthers tapering upwards, opening only at the end. Glabrous shrub. Leaves broadly lanceolate. Corolla deeply lobed . . . *4. *S. pseudocapsicum*.
 Flowers unknown. Shrub. Leaves ovate, pubescent underneath 5. *S. shanesii*.

§ 2. No prickles. Stellate pubescence or tomentum on the whole plant or rarely on the flowers only.

Flowers in forked pedunculate cymes.

Leaves quite glabrous. Cymes loose. Corolla deeply lobed . . . 6. *S. viride*.

Leaves (large) very soft and densely tomentose. Cymes dense.

Leaves shortly acuminate, without stipule-like leaves at the base 8. *S. verbascifolium*.

Leaves long-acuminat, mostly with small semicircular stipule-like leaves at the base **S. auriculatum*.

Flowers in simple lateral racemes or clusters.

Leaves sprinkled with scattered stellate hairs. Corolla deeply lobed 7. *S. tetrandrum*.

Leaves densely or closely tomentose underneath or on both sides.

(See § 3, of which several species, especially *S. discolor*, *S. esuriale*, *S. farfarcum*, and *S. dianthophorum*, are occasionally unarmed.)

§ 3. Prickles slender on the branches and leaves (numerous few or very rare), none on the calyxes. Stellate pubescence or tomentum on the whole plant or rarely on the flowers only.

Leaves glabrous above except along the veins (rarely scabrous-pubescent in *S. violaceum*), tomentose underneath (except in *S. defensum*).

Flowers rather small, the corolla deeply lobed.

Leaves tomentose and white underneath.

Leaves ovate or elliptical, rarely above 2 in. long. Tomentum very close and short 9. *S. discolor*.

Leaves lanceolate, large and broad or small and narrow, mostly acute. Tomentum close or loose 10. *S. stelligerum*.

Leaves narrow-oblong obtuse, usually small. Tomentum close 11. *S. parvifolium*.

Leaves green underneath, glabrous or loosely stellate-hairy.

Leaves linear or linear-lanceolate, entire or hastate.

Branches slender. Prickles abundant 12. *S. ferocissimum*.

Leaves oblong-lanceolate, pinnatifid, 5 to 6 in. long. 13. *S. defensum*.

Flowers large, the corolla-lobes broad and short.

Leaves broadly lanceolate. Ovary 2-celled 14. *S. violaceum*.

Leaves oblong-linear or linear-lanceolate. Ovary 2-celled 15. *S. amblymerum*.

Leaves oblong or ovate-oblong, obtuse, cordate at the base.

Ovary 4-celled 16. *S. tetralhecum*.

Leaves closely whitish tomentose on both sides (the tomentum rarely disappearing at length on the upper side). Calyx-teeth very small at the time of flowering.

Leaves small, mostly broad on very short petioles.

Leaves under $\frac{1}{2}$ in. long, ovate or broadly oblong 17. *S. elachophyllum*.

Leaves orbicular, about $\frac{1}{2}$ in. long. Corolla deeply lobed 18. *S. orbiculatum*.

Leaves cordate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Corolla-lobes short and broad 19. *S. oligacanthum*.

Leaves narrow or on long petioles, mostly above $\frac{3}{4}$ in. long.

Leaves ovate oblong or lanceolate, entire or sinuate-toothed.

Corolla deeply lobed ($\frac{1}{2}$ to $\frac{3}{4}$ in. diameter) 20. *S. esuriale*.

Leaves ovate-lanceolate or lanceolate, mostly lobed at the base. Corolla-lobes rather short ($\frac{1}{2}$ in. diameter) 21. *S. chenopodium*.

Leaves oblong or lanceolate, entire. Corolla with short broad lobes ($\frac{3}{4}$ to 1 in. diameter) 22. *S. Sturtianum*.

Leaves densely and softly tomentose or velvety hirsute on both

sides or at least underneath, sometimes greener and shortly tomentose above.

Racemes short, few-flowered or pedicels solitary or 2 together.

Calyx divided nearly to the base into narrow segments.

Calyx-segments subulate-acuminate.

Leaves mostly entire, scabrous above with scattered hairs.

Stems usually prickly. Flowers mostly racemose . 23. *S. furfuraceum*.

Prickles exceedingly rare. Flowers mostly in pairs . 24. *S. dianthophorum*.

Leaves densely velvety-tomentose on both sides, the larger ones much sinuate 25. *S. Dallachii*.

Calyx-segments lanceolate, acute. Leaves densely velvety tomentose or hirsute on both sides 26. *S. densevestitum*.

Calyx-segments oblong-linear obtuse. Leaves (small) densely tomentose 27. *S. nemophilum*.

Calyx campanulate with broad lobes. (Western species) . . 28. *S. Oldfieldii*.

Racemes or cymes many-flowered, on long very prickly peduncles. Leaves green and closely tomentose above, white

and softly tomentose underneath, often lobed 29. *S. semiarmatum*.

§ 4. Prickles slender or rarely thickened at the base on the calyxes as well as on the branches and generally on the leaves. Stellate pubescence, rarely mixed with simple hairs, on the whole plant or on the corolla only.

Leaves green and glabrous or sprinkled with stellate hairs or hirsute on the upper or both sides, sinuate-lobed or pinnatifid.

Leaves glabrous or sprinkled with very few small hairs. Flowers in short loose racemes.

Leaf-lobes very obtuse and rounded at the end 30. *S. sodomæum*.

Leaf-lobes mostly acute.

Corolla unarmed 31. *S. armatum*.

Corolla armed with prickles 32. *S. hystrix*.

Leaves sprinkled with stellate hairs or hirsute, without any glandular pubescence.

Male flowers racemose, female solitary. Berry enclosed in the very prickly calyx 33. *S. cataphractum*.

Flowers hermaphrodite, in pairs, the pedicels slender, not racemose. Calyx-lobes narrow, acuminate 34. *S. pungetium*.

Flowers hermaphrodite, racemose. Calyx-lobes broad, acute . 35. *S. eremophilum*.

Leaves hirsute and glandular-pubescent on both sides. Flowers racemose.

Corolla large, broadly campanulate, very shortly lobed . . 36. *S. campanulatum*.

Corolla rather small, deeply lobed 37. *S. adenophorum*.

Leaves green and glabrous or slightly stellate above, white and densely tomentose underneath.

Leaf-lobes rather acute. Calyx-lobes acuminate 38. *S. cinereum*.

Leaf-lobes obtuse. Calyx-lobes short and broad, not acuminate 39. *S. lacunarium*.

Leaves nearly equally tomentose on both sides, sinuate-lobed or pinnatifid.

Calyx-lobes narrow, acuminate.

Calyx-lobes with very prominent keels or midribs. Leaf-lobes short, very undulate 40. *S. petrophilum*.

Calyx-lobes without prominent ribs. Leaf-lobes deep, very obtuse or spatulate 41. *S. diversiflorum*.

Calyx-lobes broad, obtuse or acute, much enlarged round the fruit after flowering.

Leaves narrow, shortly tomentose with very numerous long prickles 42. *S. carduiforme*.

- Leaves broad, very densely and softly tomentose with few prickles 43. *S. melanospermum*.
 Leaves nearly equally, densely and softly tomentose on both sides, entire or slightly sinuate.
 Leaves acute or scarcely obtuse, mostly undulate (1 to 2 in. long), with very numerous long prickles 44. *S. horridum*.
 Leaves obtuse (mostly under 2 in. long), entire or sinuate, with few or no prickles.
 Fruiting calyx membranous, globular, very prickly, completely enclosing the fruit. Leaves ovate or oblong 45. *S. echinatum*.
 Fruiting calyx globular, thick, nearly enclosing the fruit. Leaves orbicular or broadly ovate 46. *S. lasiophyllum*.
 Fruiting calyx open, 6 to 8 lines diameter. Ovary 3-celled 47. *S. ellipticum*.
 Leaves mostly acuminate or acute (3 in. long or more), entire, not at all or scarcely prickly.
 Flowering calyx under 3 lines long; fruiting calyx 6 to 8 lines diameter. Ovary 4-celled. 48. *S. quadriloculatum*.
 Flowering calyx $\frac{1}{2}$ in. long; fruiting calyx nearly 2 in. diameter. (Ovary not seen) 49. *S. phlomoides*.
 Leaves lanceolate, rather obtuse (1 to 3 in. long), entire. Calyx with a globular very prickly tube and long linear lobes.
 Flowers large 50. *S. Cunninghamii*.
 There are in the Hookerian as well as in the Muellerian herbarium a few specimens of what appear to be additional species of *Solanum*, but too imperfect for determination.

§ 1. *Unarmed. Pubescence simple or none.*

1. ***S. nigrum*, Linn. Sp. Pl. 266.** An erect annual or biennial, with very spreading branches, 1 to nearly 2 ft. high, glabrous or pubescent with simple hairs, without prickles, but the angles of the stem often raised and smooth or rough with prominent tubercles. Leaves petiolate, ovate, with coarse irregular angular teeth or nearly entire, 1 to 2 in. long. Flowers small and white, in little cymes usually contracted into umbels, on a common peduncle, from very short to nearly 1 in. long. Calyx 5-toothed or lobed to the middle. Corolla deeply lobed, 3 to nearly 4 lines diameter. Anthers very obtuse and short, opening in terminal slits, often at length continued down the sides. Berry small, globular, usually nearly black, but sometimes green yellow or dingy red.—R. Br. Prod. 445; Hook. f. Fl. Tasm. i. 288; *Solanum* "*Morella vera*," Dun. in DC. Prod. xiii. part i. 45 to 59, as to the greater number of the supposed species included in the group; *S. rubrum*, Mill.; Nees in Pl. Preiss. i. 345.

N. Australia. Gilbert river, *F. Mueller*.

Queensland. Broad Sound, *R. Brown*; Port Curtis, *McGillivray*; Rockingham Bay, *Dallachy*; Nerkool Creek, *Bowman*; Rockhampton, *O'Shanassy*.

N. S. Wales. Port Jackson, common, *Banks* and *Solander* and many others; northward to Hastings river, *Beckler*; New England, *C. Stuart*; southward to Gabo Island, *Maplestone*; in the interior on the Darling river, *Victorian Expedition*.

Victoria. About Melbourne, *Adamson, F. Mueller*; Murray river, *F. Mueller*.

Tasmania. Throughout the island on waste places, etc., especially near the sea, *J. D. Hooker*.

S. Australia. Lofty Range, *F. Mueller*; Kangaroo Island, *Waterhouse*.

W. Australia. Bald Island and Mount Manypeak river, *Macxwell*; Swan River, *Preiss*.

This species is a common weed in almost all tropical and temperate parts of the world, but in many places, as probably in some of the Australian localities, introduced with culti-





vation. The berries are said by several Australian collectors to be frequently eaten. They vary in colour as in Europe, black yellow or red.

2. *S. aviculare*, Forst. Prod. 18. An erect glabrous unarmed vigorous undershrub or shrub, attaining 5 or 6 ft. or even more, flowering the first year so as then to appear herbaceous. Leaves lanceolate, acute or rarely almost obtuse, mostly entire on the older shrubby individuals, often pinnatifid with 1, 2 or 3 lanceolate lobes on each side on the younger ones, especially the first year, the larger leaves 6 to 10 in. long, but in some specimens all under 4 in., tapering at the base and often shortly petiolate, in some varieties decurrent so as to form raised angles on the stems. Flowers few, large, in short loose pedunculate racemes, mostly lateral. Pedicels rather long. Calyx-lobes short, broad, very obtuse or mucronate. Corolla $\frac{3}{4}$ to 1 in. diameter, very shortly and broadly lobed. Filaments filiform, as long as or longer than the anthers, which are oblong, very obtuse, parallel, opening in terminal transverse slits, which are at length more or less continued down the sides and often to the base. Stigma capitate, slightly 2-lobed. Berries ovoid or globular, green or yellow, rather large. — *Dum.* in DC. Prod. xiii. part i. 69; *Hook.* f. Fl. Tasm. i. 288; *S. laciniatum*, *Alt. Hort. Kew.* ed. 1, i. 247; *R. Br.* Prodr. 145; *Bot. Mag.* t. 349; *Dum.* l. c. 69; *S. reclinatum*, *L'Hér.*; *Dum.* l. c. 68; *S. vescenti*, *F. Muell.* in *Trans. Vict. Inst.* 1855, 69, in *Hook. Kew Journ.* viii. 165 and 336, and *Pl. Vict.* ii. t. 62.

Queensland. Brisbane river, *Henne*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Schieb.* v. 255, and several others; Sydney woods, Paris Exhibition, 1855, *W. Arthur*, v. 208; northward to Hastings river, *Beckler*; southward to Twofold Bay, *F. Mueller*.

Victoria. Port Phillip, *Gunn*; Portland, *Robertson*; about Melbourne, *Adams*, *F. Mueller*; sandy plains at the entrance of Sorey River, Lakes King and Wellington, sources of the Yarra, *F. Mueller*.

Tasmania. Islands of Bass's Straits, *R. Brown*; common in damp shady woods, etc., *J. D. Hooker*.

S. Australia. Mount Gambier, *F. Mueller*.

The species is also in New Zealand. *F. Mueller* distinguishes his *S. venustum* by the sessile decurrent leaves, less deeply lobed corollas, longer filaments in proportion to the anthers, and edible globular greenish berries, known in Gipps' Land under the name of "Gunya-ra," whilst in the true *S. aviculare* the leaves are not decurrent, the filaments shorter, and the berry ovoid, yellow, and inedible. There certainly appear from all accounts to be in this as in so many other species, marked varieties in the form, colour, and quality of the fruit, but I cannot trace, from the materials and notes before me, any correspondence between these and the forms of the foliage. *F. Mueller's* Twofold Bay specimens have the most prominently decurrent leaves with the berries not specially described; those from Gipps' Land have more or less decurrent leaves, and globular greenish berries; and the original New Zealand as well as the Tasmanian plant have leaves not at all or only slightly decurrent, and yellowish ovoid berries, but which are eaten, at least in New Zealand. Another variety, however, apparently the common Port Jackson one, and which is one of those early cultivated in European botanic gardens, has the leaves not decurrent, but the berries globular, of a yellowish green. *Steud.*'s and other Blue Mountain specimens have the leaves somewhat decurrent, and some of these are described as having ovoid edible berries. There would appear, therefore, to be several distinct varieties or races, of which two, well distinguished by *F. Mueller*, are in Victoria, and one, two, three or more in N. S. Wales, which can only be characterized by observing them in a living state. *S. reclinatum*, *L'Hér.*, appears to have been always described from garden specimens, probably of the same N. S. Wales origin as *Atton's* plant, with a mistaken indication of a Peruvian origin. A specimen dried in 1822

in the Montpellier garden as authentic, is certainly undistinguishable from the N. S. Wales *S. laciniatum*.

3. **S. simile**, *F. Muell. Trans. Phil. Soc. Vict.* i. 19, and *Fragm.* vi. 145. A glabrous erect unarmed undershrub or shrub, closely resembling entire-leaved specimens of *S. aviculare*, usually not so stout, although attaining 4 or 5 ft. Leaves lanceolate or linear, usually obtuse, contracted into a short petiole, not decurrent, entire or rarely with 1 or 2 short lobes on each side near the base, mostly only 2 or 3 in. long. Flowers smaller than in *S. aviculare*, few in lateral racemes, with a very short or sometimes scarcely any common peduncle. Calyx and corolla otherwise nearly as in *S. aviculare*, the corolla not much above $\frac{1}{2}$ in. diameter. Anthers obtuse, parallel, opening at length down the sides. Berry globular ovoid or oblong, usually smaller than in *S. aviculare*, and purple. Seeds rather large.—*S. laciniatum*, var., R. Br. Prod. 115; Benth. in Hueg. Enum. 82; Nees in Pl. Preiss. i. 345; *S. fasciculatum*, *F. Muell. Fragm.* i. 123, vi. 144.

N. S. Wales. Darling river, *Dallachy*; Murray river, *F. Mueller*.

Victoria. Wimmera, *Dallachy*.

S. Australia. Port Lincoln, *Walldén*; Spencer's Gulf and Kangaroo Island, *R. Brown, F. Mueller*; Mount Serle, *Warburton*; Lake Gillies, *Burkitt*.

W. Australia. Goose Island Bay, *R. Brown*; King George's Sound, *Oldfield, F. Mueller*; Fitzgerald river, *Marshall*; Swan River, *Huegel, Deammond, Oldfield*; Merchison river, *Oldfield*; Rottenest Island, *Preiss*, n. 1965.

F. Mueller distinguishes *S. fasciculatum* as a Western species with ovoid berries. I can find no other character, and there appear to be at least three different forms of fruit all included by *F. Mueller* as varieties of *S. fasciculatum*,—globular, ovoid, and oblong,—the latter sometimes at least 1 in. long and very narrow. All three are in West Australia, and the two extremes in South Australia. The narrowest-fruited specimens have also very narrow leaves, from Phillips river, *Marshall*, and Lake Gillies, *Burkitt*.

4. **S. pseudo-capsicum**, *Linna.*; *Dun. in DC. Prod.* xiii. part i. 152. A glabrous unarmed erect shrub or undershrub, attaining 3 to 4 ft. Leaves broadly lanceolate, entire, contracted into a rather long petiole. Pedicels lateral, solitary or 2 or 3 together in a cluster or on a very short common peduncle. Calyx deeply divided into ovate lanceolate herbaceous segments. Corolla white, rather small, divided to about the middle. Filaments short; anthers connivent and tapering upwards. Berry globular, bright red or yellow.

N. S. Wales. Hastings river, *Beckler*. An introduced plant of somewhat uncertain origin, now widely diffused in tropical countries, chiefly as a weed or escape from cultivation.

5. **S. ? Shanesii**, *F. Muell. Fragm.* vi. 144. An erect shrub, attaining 8 ft., with slender glabrous branches. Leaves solitary or the upper ones in pairs, ovate, acuminate, membranous, entire, glabrous above, sprinkled underneath with simple not stellate hairs, $1\frac{1}{2}$ to 2 in. long, the lamina decurrent on a rather long petiole. Flowers unknown. Fruiting pedicels solitary or 2 together, reflexed. Calyx obtuse, obscurely lobed. Berry globular, red, about $\frac{1}{2}$ in. diameter.

Queensland. More's Creek, Rockhampton, *Dallachy, O'Shanesey*. The genus as well as the immediate affinities of this species must remain uncertain until the flowers shall have

been seen. The specimens have rather the aspect of some *Capsicum* allied to *C. senense*, Jacq., than of a *Solanum*.

§ 2. Unarmed. Pubescence stellate, at least on the corolla.

6. **S. viride**, *R. Br. Prod.* 445. An erect undershrub or shrub of 6 to 7 ft. or even more, quite glabrous except the stellate pubescence of the flowers, and sometimes a very few small stellate hairs scattered on the upper leaves. Leaves solitary or in pairs, ovate-oblong, obtuse, shortly acuminate or rather acute, membranous, entire or obscurely sinuate, 3 to 5 in. long, on rather long petioles. Flowers in forked pedunculate cymes, terminal or lateral, the branches of the cyme short, the pedicels often above $\frac{1}{2}$ in. long after flowering, the whole inflorescence and calyx glabrous or slightly stellate-tomentose, the corolla always stellate-pubescent outside. Calyx scarcely above 1 line long at the time of flowering, the lobes obtuse, either very short or separating to the middle. Corolla deeply divided into narrow lobes of 3 to 4 lines. Filaments very short; anthers connivent and tapering upwards. Berries small, globular, red.—Dun. in DC. *Prod.* xiii. part i. 190; *S. viridifolium*, Dun. l. c. 73.

Queensland. Broad Sound, *R. Brown*; Cape Grafton, *Banks and Solander*; Cape York, *Darmel*; islands off the N.E. coast, *A. Cunningham*, *M'Gillivray*, *F. Mueller*, and others; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Port Mackay, *Nerast*.

7. **S. tetrandrum**, *R. Br. Prod.* 445. An erect unarmed undershrub of 2 to 3 ft., sprinkled with a small stellate tomentum, rather dense on the inflorescence, more scattered on the leaves and sometimes disappearing from the upper surface. Leaves mostly in pairs, petiolate, ovate, obtuse or shortly acuminate, entire or obscurely sinuate, membranous, the larger ones 3 to 6 in. long. Flowers small, in short loose lateral racemes, the common peduncle not so long as in *S. viride* and not at all or very rarely forked. Calyx 2 to $2\frac{1}{2}$ lines long, very tomentose, unequally divided to about the middle. Corolla stellate-pubescent outside, under $\frac{1}{2}$ in. long, divided nearly to the base into narrow lobes. Filaments short; anthers connivent and tapering upwards. Berry small, globular.—Dun. in DC. *Prod.* xiii. part i. 194; Seem. *Fl. Vit.* 176; *S. inamœnum*, Benth. in Hook. *Lond. Journ.* ii. 228; Dun. l. c. 269.

N. Australia. Arnhem N. Bay, and islands of the Gulf of Carpentaria, *R. Brown*; Goulburn Islands, *A. Cunningham*; Port Essington, *Armstrong*.

The species is also in the South Pacific islands. The flowers, in this as in *S. viride*, are occasionally, but not always, 4-merous; several 5-merous flowers occur indeed in Brown's own specimens.

Var. ? *floribundum*. Corollas larger, very tomentose, and one of the peduncles of the specimen forked.—From *Leichhardt's* collection, a single specimen in Herb. F. Mueller.

8. **S. verbascifolium**, *Ait.*; *Dun. in DC. Prod.* xiii. part i. 114. A tall stout unarmed shrub, attaining often 10 to 12 ft., thickly covered with a stellate tomentum often very dense and floccose or velvety, sometimes more scattered on the upper side of the leaves. Leaves ovate, acuminate, entire, soft and thick, often 6 to 8 in. long, on long petioles. Flowers often numerous, in dense pedunculate dichotomous cymes, terminal or at length lateral, the pedicels very short. Calyx densely tomentose, the lobes shorter than the

tube, thick and obtuse. Corolla pale blue or white, under $\frac{1}{2}$ in. diameter. Filaments short; anthers scarcely tapering but opening only at the end. Berry globular, yellow, under $\frac{1}{2}$ in. diameter.—R. Br. Prod. 444.

Queensland. Broad Sound and Shoalwater Bay, *R. Brown*; Brisbane river, Moreton Bay, *Fraser*, *F. Mueller*; Rockhampton, *Dallachy*; Nerikool Creek, *Bauman*; Port Denison, *Fitzalan*, *Dallachy*; Rockingham Bay, *Dallachy*.

N. S. Wales. Clarence river, *Beckler*.

The species is widely dispersed over tropical Asia and America.

S. auriculatum, Ait.; Dun. in DC. Prod. xiii. part 1, 115, a tropical American species, closely resembling *S. verbascofolium*, but more densely woolly, the leaves more acuminate, with a pair of stipule-like small semicircular leaves at the base of most of the petioles, and purple flowers, has been sent from the N. shore, Port Jackson, as an introduced species.

§ 3. *Prickles numerous few or occasional on the stem and often on the leaves, none on the calyces. Pubescence stellate, at least on the corolla.*

9. ***S. discolor***, *R. Br. Prod.* 145. An erect shrub, with weak half-climbing branches, the young ones as well as the under side of the leaves and inflorescence silvery or hoary with a minute, exceedingly close but dense stellate tomentum. Prickles few, slender on the branches and veins of the leaves or in some specimens none. Leaves petiolate, irregularly oval elliptical or broadly oblong, rather obtuse, entire or irregularly sinuate, glabrous and smooth on the upper surface, 1 to 2 in. long in flowering specimens, larger in barren shoots. Flowers rather small, in simple lateral racemes, few or even solitary with a very short common peduncle on the fruit-bearing specimens, numerous along a slender rachis but very deciduous upon apparently sterile ones, the pedicels short at the time of flowering, 3 to 4 lines long and thickened under the fruit. Calyx very small and shortly toothed when in flower, somewhat enlarged and more deeply cleft under the fruit. Corolla white, deeply lobed, about or under $\frac{1}{2}$ in. diameter. Berries globular, of a greenish-white, about 4 lines diameter.—Dun. in DC. Prod. xiii. part i. 293; *S. corifolium*, *F. Muell. Fragm.* ii. 166.

N. Australia. Coen river, Gulf of Carpentaria, *R. Brown*.

Queensland. Araucaria Ranges, Moreton Bay, *F. Mueller*.

This and the three following species (*S. stelligerum*, *parvifolium*, and *feracissimum*) are closely allied to each other, having nearly the same flowers and fruit, and differing chiefly in foliage and prickles.

10. ***S. stelligerum***, *Sm. Ecol. Bot.* ii. 57. *t.* 88. An erect shrub, sometimes small and slender, sometimes attaining 6 ft. or even more, the branches, under side of the leaves, and inflorescence covered with a stellate tomentum, often loose and floccose. Prickles straight or slightly recurved on the branches and sometimes on the upper side of the leaves, but not numerous. Leaves petiolate, lanceolate or ovate-lanceolate, acute or acuminate, very rarely on luxuriant shoots broad and obtuse, usually glabrous and smooth on the upper side except minute stellate hairs along the principal veins, mostly 2 to 4 in. long. Flowers blue, rather small, in lateral racemes, the common peduncle very short, the pedicels lengthening to about $\frac{1}{2}$ in. or even 1 in. under the fruit. Calyx under 2 lines long when in flower, with narrow acuminate lobes, somewhat lengthened under the fruit and then often divided to near the base. Corolla usually under $\frac{1}{2}$ in. diameter, deeply divided into

narrow lobes. Anthers connivent and tapering upwards. Berry red, glo-
bular, small.—R. Br. 445; Dun. in DC. Prod. xiii. part i. 191.

Queensland. Keppel Bay, *R. Brown*; Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Rockhampton, *Dallachy* and others; Rockingham Bay, *Dallachy*; Araucaria Ranges, Burnett river, *F. Mueller*; Armadillo, *Barton*; Warwick, *Beckler*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *Leichhardt*; Clarence and Hastings rivers, *Beckler*.

Several of the northern specimens have smaller, narrower leaves than usual, approaching those of *S. parvifolium*, but acute; one from Cape Byron, *C. Moore* (Herb. F. Muell.), has large broad leaves, more prickly than usual; and some from the Araucaria Ranges, Burnett river, *F. Mueller*, sent by him as a var. *lucorum*, have the leaves sprinkled on the upper surface with a few stellate hairs. Brown's Keppel Bay specimens have a more rufous tomentum, showing some approach to *S. furfuraceum*, but very much more glabrous on the upper surface of the leaves.

Var. ? *magnifolium*. Leaves broadly ovate, 4 to 8 in. long, mostly sinuate, with several prickles on the upper side. Flowers very few in the imperfect specimens seen, but quite those of *S. stelligerum*.—Murray river, Rockingham Bay, *Dallachy*; mountain brush, Moreton Bay, *Leichhardt* (both in Herb. F. Mueller).

11. **S. parvifolium**, *R. Br. Prod.* 446. A bushy slender shrub, closely allied to the small-leaved varieties of *S. stelligera*, but the leaves are narrow-oblong or almost linear, always obtuse, quite entire or with a short broad lobe on each side near the base, glabrous above, stellate-tomentose underneath, in some specimens not above 1 in. long, in others twice as long. Flowers blue, like those of *S. stelligera*. Calyx about 1 line long when in flower and not 2 lines when in fruit, deeply divided into acuminate lobes. Corolla deeply lobed. Berry small, globular.—Dun. in DC. Prod. xiii. part i. 191; *S. leptophyllum*, *F. Muell. Fragm.* ii. 164.

Queensland. Broad Sound, *R. Brown*; Brigalow Scrub on the Mackenzie and Suttor rivers, *F. Mueller*; in the interior, *Mitchell*; Cape river, *Bowman*; Armadillo, *Barton* (with rather larger flowers).

N. S. Wales. Liverpool Plains, *A. Cunningham*; Macnamara hills, *Fraser*; Mount Murchison, *Dallachy*.

12. **S. ferocissimum**, *Lindl. in Mitch. Three Exped.* ii. 58. A low straggling slender shrub, allied to *S. parvifolium*, the branches rather loosely stellate-tomentose. Prickles long and slender, very numerous on the branches and leaves, none on the calyx. Leaves linear or linear-lanceolate, not so obtuse as in *S. parvifolium*, entire or the larger ones hastately lobed at the base, 1 to 2 in. long, glabrous or with loose stellate hairs especially underneath, without the close tomentum of *S. parvifolium*. Flowers small, blue, in loose racemes, with a very short common peduncle and slender pedicels. Calyx 1 to 1½ lines long in flower, somewhat enlarged in fruit, deeply divided into acuminate lobes. Corolla about ½ in. diameter, deeply lobed.—Dun. in DC. Prod. xiii. part i. 373.

N. S. Wales. Tachlan river, *Mitchell*; between that and the Upper Bogan, *L. Morton*; Darling river, *Bowman*, *Panton*; Peel's Range, *Fraser*, *A. Cunningham*; Mount Murchison, *Dallachy*, *E. Giles*.

13. **S. defensum**, *F. Muell. Fragm.* v. 193. The single specimen described is an erect nearly simple shoot from a woody stock (or from the base of a shrub that has been cut down), stout and rigid, above 1½ ft. high, sea-

brous with scattered stellate hairs. Prickles straight, rather numerous on the stem and leaves, none on the calyxes. Leaves very shortly petiolate, oblong-lanceolate, acuminate, pinnatifid with short obtuse lobes or some sinuate only, 3 to 5 in. long, green on both sides, glabrous above, with a few small scattered stellate hairs underneath. Flowers blue, rather small, resembling those of *S. stelligerum*, in loose lateral racemes, the pedicels rather long even when in flower. Calyx-lobes acuminate, split almost to the base, but not exceeding 2 lines with the fruit far advanced. Corolla about $\frac{1}{2}$ in. diameter, deeply lobed. Anthers tapering upwards. Berry small, globular, but not quite ripe in the specimen.

Queensland. Cape York, *Dumet* (Herb. F. Mueller). Very remarkable in the foliage, but that may have been in some measure modified by the circumstances of growth of the only specimen known.

14. ***S. violaceum***, R. Br. *Prod.* 415. An erect shrub of several feet, the branches under side of the leaves and inflorescence covered with a stellate tomentum, sometimes dense and close, more rarely loose and floccose. Prickles slender, straight, not numerous, on the branches and sometimes on the upper side of the leaves, none on the calyxes. Leaves petiolate, lanceolate or ovate-lanceolate, acute or rather obtuse, entire or rarely sinuate, often oblique at the base but not cordate, mostly 2 to 4 in. long, glabrous on the upper surface or rarely scabrous with small stellate hairs. Flowers (violet ?) large, in lateral racemes, the common peduncle at first very short as well as the pedicels, but both sometimes much lengthened in fruit. Calyx above 2 and often 3 lines long, with acuminate teeth sometimes very short sometimes as long as the tube, somewhat enlarged and more deeply lobed when in fruit. Corolla $\frac{3}{4}$ to above 1 in. diameter, the lobes short and very broad. Berry globular, larger than in *S. stelligerum*.—Dun. in DC. *Prod.* xiii. part i. 335; *S. Brownii*, Dun. *Hist. Solan.* 201.

N. S. Wales. Paterson's River, R. Brown; Blue Mountains, A. Cunningham and others; Clarence and Hastings rivers, Beckler; Richmond river, Forsett; Glendon, Leichhardt.

Var. ? *scabrum*. Upper side of the leaves very scabrous. Calyx-teeth short.—N. S. Wales, Vicary, C. Moore.

The species sometimes resembles some forms of *S. stelligerum* in foliage, but is at once distinguished by the large and differently-shaped calyx and corolla.

15. ***S. amblymerum***, Dun. in DC. *Prod.* xiii. part i. 294. An erect shrub of several feet, the branches under side of the leaves and inflorescence covered with a dense stellate tomentum usually close. Prickles slender, straight, on the branches and often on the leaves, none on the calyxes. Leaves shortly petiolate, narrow-lanceolate or almost linear, rather obtuse, entire or with short obtuse lobes near the base, 2 to 4 in. long, the upper surface glabrous and smooth or slightly scabrous with minute scattered stellate hairs. Flowers large like those of *S. violaceum*, in lateral racemes, usually more numerous than in that species, with the common peduncle more developed. Calyx about 3 lines long when in flower, with small acuminate teeth, enlarged and more lobed after flowering. Corolla fully $\frac{3}{4}$ in. diameter with short broad lobes. Anthers tapering upwards. Ovary 2-celled. Berry globular.

Queensland. Warwick, Beckler.

N. S. Wales. Macquarie river, A. Cunningham; New England, C. Stuart.

These specimens were all included by F. Muell. in his *S. tetra-thecum*, but he finds the different ranges in calyx, and corolla, 1 find the ovary 2-celled only in all the flowers I examined. They may possibly, however, prove to be a narrow-leaved variety of *S. elaeagnifolium*.

16. *S. tetra-thecum*, F. Muell. *Frug.* ii. 165 (*partly*). A straggling shrub, the branches under side of the leaves and inflorescence covered with a close but dense and soft stellate tomentum. Prickles few on the branches, and in some specimens none. Leaves petiolate, ovate oblong or oblong-lanceolate, very obtuse, slightly cordate at the base, 1 to 3 in. long, the upper side glabrous or sprinkled with scattered stellate hairs. Flowers rather large, few together in lateral racemes, the pedicels at first very short, lengthening to about $\frac{1}{2}$ in. Calyx about 2 lines long, with minute teeth, scarcely enlarged but somewhat lobed when in fruit. Corolla deeply lobed, about $\frac{3}{4}$ in. diameter, of a rather firm consistence. Anthers tapering upwards. Ovary 4-celled, as well as the globular berry.

Queensland. Aramacia ranges, Burnett river, F. Muell.; near Morpeth, Leichhardt. The ovary and fruit in this and *S. tetra-thecum* are probably, as in other species, dicarpellary, but each carpel divided by a spurious dissepiment, as in some *Coult. lucas* and most *Boraginæ*.

17. *S. elachophyllum*, F. Muell. *Frug.* ii. 164. A slender straggling shrub, the branches and foliage hoary or silvery with a very close stellate tomentum, less white on the upper side of the leaves. Prickles slender, abundant on the branches, none on the leaves or calyxes. Leaves ovate obovate or broadly oblong, narrowed into a very short petiole, entire, 3 to 5 or rarely 6 lines long. Flowers solitary or few together in short lateral racemes. Calyx when in flower about 1 line long with small teeth, enlarged and more divided when in fruit. Corolla "violet," about $\frac{1}{2}$ in. diameter, deeply lobed. Berries globular, variegated, nearly $\frac{1}{2}$ in. diameter, the fruiting pedicels $\frac{1}{2}$ in. long.

Queensland. Between Mackenzie and Dawson rivers, F. Muell. Differs from all other Australian *Solanums* in its small leaves.

18. *S. orbiculatum*, Dur. in Poir. *Dict. Suppl.* iii. 762, and in DC. *Prod.* xiii. part i. 292. A scrubby irregularly spreading shrub usually of 2 to 3 ft., but sometimes twice that height, the branches foliage and inflorescence covered with a close but dense stellate tomentum. Prickles rather stout, straight or recurved, rather numerous on the branches, none on the leaves or calyxes. Leaves shortly petiolate orbicular or very broadly and obscurely cordate or almost reniform, very obtuse, entire or slightly sinuate, thick and soft, usually about $\frac{1}{2}$ in. or rarely $\frac{3}{4}$ in. diameter. Flowers very few together in lateral racemes, the common peduncle exceedingly short, the pedicels also short at first but lengthening to nearly $\frac{1}{2}$ in. when in fruit. Calyx small with short broad very obtuse teeth and densely tomentose. Corolla densely tomentose, deeply lobed, about $\frac{1}{2}$ in. diameter. Stamens tapering upwards. Berry small, globular.

W. Australia. Sharks' Bay and Dirk Hartog's Island, Milne, Marchison river, Oldfield, Drummond, 6th Coll. n. 130.

19. **S. oligacanthum**, *F. Muell. in Trans. Phil. Soc. Vict. i. 19, and in Hook. Kew Journ. viii. 167.* Evidently closely allied to *S. orbiculatum*, with the same tomentum, prickles, small leaves, inflorescence and flowers, except that the petioles are still shorter, the leaves more cordate, and the corolla apparently less deeply divided.

S. Australia. In the interior, *Sturt*, described from a single small specimen in *Herb. F. Mueller*.

20. **S. esuriale**, *Lindl. in Mitch. Three Exped. ii. 43.* A low shrub, often under 6 in. high and rarely exceeding 1 ft., the branches inflorescence and both sides of the leaves covered with a close but dense and soft stellate tomentum, rarely somewhat looser underneath. Prickles few and slender on the stems or the whole plant unarmed. Leaves petiolate, ovate oblong or lanceolate, obtuse, entire or sinuate-toothed, mostly $\frac{3}{4}$ to 1 in. long, but in luxuriant specimens narrow-lanceolate entire and 2 to 3 in. long. Flowers solitary or 2 to 4 together, on a very short lateral common peduncle, the pedicels lengthening to $\frac{1}{2}$ in. Calyx under 2 lines when in flower with narrow almost acute teeth, enlarged after flowering and dividing into triangular acuminate lobes. Corolla blue, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, deeply lobed. Anthers tapering upwards. Berry globular.—*Dun. in DC. Prod. xiii. part i. 373; S. pulchellum, F. Muell. in Trans. Phil. Soc. Vict. i. 18, and in Hook. Kew Journ. viii. 166.*

N. Australia. *Sturt's Creek, F. Mueller.*

Queensland. Ranges about Lake Salvator, *Mitchell*; Upper Burdekin river, *F. Mueller*; Sutor and Bowen rivers, *Bowman*; Armadillo and Curriwillighi, *Barton*.

N. S. Wales. Peck's Range, *Mitchell, A. Cunningham, Fraser*; from the Murray, Lachlan, and Darling to the western frontier, *Victorian and other Expeditions*.

Victoria. Wimmera, Avoca, and Murray rivers, *F. Mueller, Dallachy*.

S. Australia. From the Murray to St. Vincent's and Spencer's gulfs, *F. Mueller* and others; Cooper's Creek, *Howitt's Expedition*; Purdie's Ponds, *Waterhouse*.

21. **S. chenopodium**, *F. Muell. Fragm. ii. 165.* A slender divaricate shrub of 2 to 3 ft., with the close stellate tomentum of *S. esuriale*, which however sometimes almost disappears from the upper surface of the old leaves. Prickles slender, few or rarely more numerous on the branches, very rare on the leaves and none on the calyxes. Leaves petiolate ovate-lanceolate or lanceolate, the broader ones cordate at the base, rather obtuse, sinuate-lobed towards the base and sometimes hastate, mostly 1 to 2 in. long. Flowers few in short lateral racemes. Calyx scarcely $1\frac{1}{2}$ lines long when in flower with very small teeth, more deeply lobed but scarcely above 2 lines long when in fruit. Corolla blue, about $\frac{1}{2}$ in. diameter, the lobes rather broad and short. Berry globular, shining, rather small.

N. Australia. In the interior, between Mount Blight and Mount Fisher, lat. $20^{\circ} 20'$, *McDouall Stuart's Expedition*.

N. S. Wales. From the Darling river to the Barrier Range, *Victorian Expedition*; Mount Murchison, *Bonney*.

S. Australia. Cooper's Creek, *Howitt's Expedition*.

The species differs from *S. esuriale* in its taller stature, mostly lobed or hastate leaves, and apparently in the form of the corolla.

22. **S. Sturtianum**, *F. Muell. in Trans. Phil. Soc. Vict. i. 19, and in*

Hook. New Journ. viii. 166. An erect shrub with the close stellate tomentum and rare prickles of *S. esuriale*, but apparently of taller stature. Leaves petiolate, oblong or lanceolate, obtuse, entire or scarcely sinuate, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Peduncles usually rather longer than in *S. esuriale*, bearing a short raceme of very few rather large flowers, the pedicels very short at the time of flowering but lengthening afterwards. Calyx about 2 lines long when in flower, with short acute teeth, much enlarged and irregularly lobed when in fruit. Corolla $\frac{3}{4}$ to 1 in. diameter, with short broad lobes. Anthers tapering upwards. Berry black, above $\frac{1}{2}$ in. diameter.

N. Australia, Glencg district, N.W. coast, *Marten*.

S. Australia. In the interior, *Sturt*, Flinders Range and Cooper's Creek, *Hossett's Expedition*; Mount Searl, *Warburton*; Lake Gillies, *Burkitt*.

The species differs from *S. esuriale* chiefly in the large slightly lobed corolla.

23. **S. furfuraceum**, *R. Br. Prod.* 446 (the char. wrong as to the leaves by a clerical error). An erect spreading shrub of 4 to 6 ft., the branches and inflorescence covered with a rather loose rusty tomentum. Prickles straight, slender, not numerous on the branches, very rare on the leaves and none on the calyxes. Leaves petiolate, ovate or ovate-lanceolate, acute acuminate or almost obtuse, entire or sinuate, rounded or slightly cordate at the base, not above 2 in. long in our specimens, more or less scabrous above with stellate hairs sometimes very dense, densely tomentose underneath and often woolly or floccose. Flowers blue in rather dense lateral racemes, the pedicels short. Calyx divided almost to the base into narrow acuminate lobes, above 2 lines long at the time of flowering, 4 to 6 lines when in fruit. Corolla rather large, divided to near the middle into broad lobes. Berry globular, much larger than in *S. stelligerum*, the enlarged calyx-segments broadly lanceolate, subulate-acuminate. — *Dun. in DC. Prod.* xiii. part i. 293.

Queensland. Broad Sound, *R. Brown*; Brisbane river, Moreton Bay, *Fraser, F. Mueller*; Mogile scrub, *C. Stuart*; Rockhampton, *Dallachy, O'Shaughy*; Table mountain, *Bowman*.

This species has been frequently misunderstood and the name applied to *S. parvifolium*, or to varieties of *S. stelligerum*, owing to a clerical error in Brown's diagnosis. In his notes, as well as in Dunal's detailed description, the leaves are correctly described as ovate lanceolate and scabrous-tomentose on the upper side. It appears that Brown had originally intended to give to the present species the name of *S. parvifolium*, which he afterwards transferred to another, and in writing out the diagnosis of *S. furfuraceum* for press, retained by mistake the character as to foliage of *S. parvifolium*, the remainder appertaining to *S. furfuraceum*. Dunal copies Brown's diagnosis without remark, although in contradiction to the accurate description which follows.

24. **S. dianthophorum**, *Dun. Hist. Sol.* 183, and in *DC. Prod.* xiii. part i. 192. Perhaps a variety only of *S. furfuraceum*, with the same indumentum, but a more spreading slender shrub without any prickles at all or very rarely with a very few small slender prickles on the stem. Leaves as in *S. furfuraceum*, ovate or ovate-lanceolate entire or slightly sinuate, rarely above 1 in. long. Flowers solitary or two together on slender pedicels rarely above $\frac{1}{2}$ in. long. Calyx of *S. furfuraceum*. Corolla rather smaller. Anthers much acuminate. Berry like that of *S. furfuraceum*. *S. hyfornum*, *R. Br. Prod.* 445, not of *Lour*.

Queensland. Bay of Inlets, *Banks and Solander*; Port Bowen, *R. Brown*; Perry Islands, *A. Cunningham*.

25. ***S. Dallachii*, Benth.** An erect stout shrub of 6 to 10 ft., the branches inflorescence and foliage densely villous with loose velvety hairs mostly stellate at the base. Prickles slender, very rare on the branches and leaves, none on the inflorescence. Leaves broadly ovate, acuminate, the larger ones 6 to 8 in. long and 4 to 5 in. broad, and mostly sinuate-toothed, the smaller ones entire and resembling those of *S. densevestitum*. Peduncles axillary, often longer than in the allied species, bearing a short raceme almost contracted into an umbel and sometimes forked. Pedicels under $\frac{1}{2}$ in. long when in flower, nearly 1 in. when in fruit. Calyx at the time of flowering nearly 3 lines long, with narrow acuminate teeth or lobes, somewhat enlarged in fruit, and then deeply divided into lanceolate subulate-acuminate lobes. Corolla blue, deeply lobed, about $\frac{1}{2}$ in. diameter. Anthers tapering upwards. Berry yellow, globular, glabrous.—*S. repandum*, *F. Muell. Fragm.* vi. 145, not of Forster.

Queensland. Rockingham Bay, *Dallachy*. I cannot agree with *F. Mueller* in referring this plant to *S. repandum*, Forst., notwithstanding a general resemblance in the larger leaves, for in all our specimens Forster's plant differs in the more sessile and denser inflorescence, in the broadly campanulate and broadly lobed calyx (usually larger than is represented in Seemann's figure, *Fl. Vit.* t. 38), and in the larger hirsute berry. *S. Dallachii* appears to me to be much nearer allied to *S. stelligerum*, and especially to *S. forficatum*, differing chiefly in indumentum and in the larger leaves. Those specimens, indeed, from Rockingham Bay which I have mentioned above as a large-leaved doubtful variety of *S. stelligerum*, were included by *F. Mueller* under *S. repandum*.

26. ***S. densevestitum*, F. Muell. in Herb. Hook.** An erect shrub of several feet, the branches inflorescence and foliage densely villous with loose velvety-stellate hairs sometimes more tomentose but very soft and almost floccose. Prickles slender, very few or rarely rather numerous on the stems, very rare on the leaves and none on the inflorescence or calyxes. Leaves ovate or ovate-lanceolate, rather obtuse, entire or slightly sinuate, often somewhat cordate, thick and soft, 2 to 3 in. long. Flowers solitary or very few in short almost sessile lateral racemes, the pedicels also short. Calyx hispid, divided to the base into lanceolate acute segments about 3 lines long at the time of flowering, longer when in fruit. Corolla about $\frac{3}{4}$ to 1 in. diameter, rather deeply divided into broad lobes.

Queensland. Araucaria ranges, Upper Barnett river, *F. Mueller*; Brisbane river, Moreton Bay, *F. Mueller* and others; also in *Leichhardt's* collection.

N. S. Wales. New England, *C. Stuart*; Hastings river, *Beckler*; Mount Lindsay, *C. Moore*.

This may possibly prove to be a remarkable variety of *S. forficatum*, but, besides the indumentum, the calyx is certainly different and the flower larger.

27. ***S. nemophilum*, F. Muell. Fragm.** ii. 161. A low spreading shrub, the branches inflorescence and foliage covered with a soft thick stellate tomentum. Prickles none in the specimens seen, probably rare on the branches. Leaves ovate oblong or almost lanceolate, rather obtuse, entire, rounded or slightly cordate at the base, thick and soft, 1 to 2 in. long. Flowers violet, solitary or 2 or 3 together on a very short lateral common

peduncle, the pedicels at length nearly $\frac{1}{2}$ in. long. Calyx divided to the base into narrow obtuse thick and woolly segments, 2 to 3 lines long when in flower and but slightly enlarged when in fruit. Corolla above $\frac{1}{2}$ in. diameter, deeply lobed. Berry red, ovoid (*F. Muell.*).

Queensland. Ironbark forest between the Macintyre and Dawson rivers, *F. Muell.*; Burnett river, *Holty*; Flinders river, *Sutherland*. The ovary berries of some specimens appear globular. The species is very near the last three, but the calyx-segments remarkably obtuse, besides the differences in foliage and indumentum.

28. **S. Oldfieldii**, *F. Muell. Fragm.* ii. 161. An erect shrub of 1 to 3 ft., the branches inflorescence and under side of the leaves covered with a soft dense more or less rusty stellate tomentum, sometimes almost floccose, sometimes closer and more hoary, usually shorter and more scabrous on the upper side of the leaves. Prickles small and slender, not numerous on the branches, none on the leaves or inflorescence and sometimes the whole plant unarmed. Leaves petiolate, ovate or oval-oblong, very obtuse, entire sinuate or undulate, thick and soft, mostly 1 to 2 in. long. Flowers rather large, several in pedunculate racemes very rarely once forked. Calyx rusty-villous, broadly campanulate, about 3 lines long, with broad obtuse lobes shorter than the tube at the time of flowering, enlarged and more deeply divided in fruit. Corolla apparently about 1 in. diameter, with short broad lobes. Anthers rather short and scarcely tapering upwards, the filaments longer than in the other species of the group. Ovary 2-celled. Berry globular, yellow, at least $\frac{1}{2}$ in. diameter.

W. Australia, *Drummond*, *2nd Coll.* n. 224, and *Suppl.* n. 7; Marchison river and Champion Bay, *Oldfield*.

29. **S. semiarmatum**, *F. Muell. Fragm.* ii. 163. An erect shrub, the branches and inflorescence covered with a dense hoary or white stellate tomentum sometimes floccose. Prickles slender, straight, very numerous on the branches and on the peduncles, very rare on the leaves and none on the calyxes. Leaves petiolate, ovate or ovate-lanceolate and scarcely lobed when small, the larger ones broad and pinnatifid with triangular or lanceolate lobes, green but softly tomentose on the upper side, very white-tomentose underneath, 2 to 4 in. long. Flowers numerous in loose pedunculate lateral simple racemes or more frequently branched cymes, usually as long as the leaves. Pedicels slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long at the time of flowering. Calyx turbinate, about 2 lines long, the lobes almost obtuse to subulate-acuminate, longer than the tube, enlarged after flowering and sometimes separating to the base. Corolla $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, divided to below the middle. Anthers tapering upwards. Berry globular when young, not seen ripe.

Queensland. In the interior, *Mitchell*; Connor's River, *Bowman*. The leaves usually scarcely lobed, although a few are larger and more lobed, showing the connection with the typical specimens.

N. S. Wales. Clarence river, *Beckler*; Richmond river, *C. Moore* (small but evidently luxuriant specimens, with large deeply lobed leaves and ample inflorescence); Darling Downs, *Law* (like the Queensland specimens).

The species forms a passage from the third to the fourth group, the prickles being abundant on the peduncles, but the calyxes entirely unarmed.

§ 4. *Prickles on the calyxes as well as on the rest of the plant. Pubescence stellate, rarely almost simple or none.*

*30. **S. sodomæum**, *Lim.*; *Dun. in DC. Prod.* xiii. part i. 366. A spreading or diffuse shrub or herb of 2 to 3 ft., the foliage green but sprinkled as well as the branches with a few small stellate hairs. Prickles stout, often thickened downwards on the stem and leaves, more slender on the calyxes. Leaves deeply pinnatifid, with very obtuse rounded obovate or spatulate lobes, often sinuate, the whole leaf 3 to 6 in. long. Racemes pedunculate, few-flowered, short and simple or rarely once-forked. Calyx divided to the middle into obtuse lobes. Corolla rather large, divided to near the middle into broad lobes. Berries globular, rather large, variegated green and white or at length yellow.—*Sibth. Fl. Græc.* t. 235.

N. S. Wales and Victoria. A native of the Mediterranean region and of S. Africa, early introduced into the neighbourhood of Port Jackson, *R. Brown*, and now naturalized there as well as at Plenty Creek in Victoria, and probably some other places, *F. Mueller* and others.

31. **S. armatum**, *R. Br. Prod.* 446. A diffuse herb or undershrub of 2 to 3 ft., quite glabrous except the corolla, or with a very few small stellate hairs scattered on the young shoots. Prickles slender, numerous on the stems, leaves, inflorescence, and calyxes. Leaves ovate or broadly oblong-lanceolate, acute, sinuate-lobed or pinnatifid, with acute broad or rarely narrow often sinuate lobes, the larger leaves 3 to 4 in. long. Flowers usually 2 or 3 but sometimes more numerous in loose lateral racemes, the common peduncle more or less elongated above the lowest pedicel, the pedicels rather long. Calyx 4 to 5 lines long at the time of flowering, with lanceolate acuminate lobes, and scarcely enlarged afterwards. Corolla $\frac{3}{4}$ to 1 in. diameter, stellate-pubescent outside, the lobes not very deep, acute or sometimes much dilated and obtuse. Filaments short; anthers scarcely tapering upwards. Berry globular, variegated, above $\frac{1}{2}$ in. diameter.—*Dun. in DC. Prod.* xiii. part i. 295; *S. hystrix*, *Dun. l. c.* 296 and some others, but not of *R. Br.*; *S. pungetium*, *Sieb. Pl. Exs.* not of *R. Br.*

Queensland. Near Warwick, *Beckler*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 254, and many others; Hastings river, *Beckler*.

Victoria. Lake King and shaded valleys Dandenong Ranges, *F. Mueller*.

S. prinophyllum, *Dun. in DC. Prod.* xiii. part i. 296, from Port Jackson, is probably, from his description, the same as *S. armatum*.

32. **S. hystrix**, *R. Br. Prod.* 446. A diffuse but rigid herb, quite glabrous, every part densely covered with long rather stout straight prickles. Leaves narrow oblong, sinuate or pinnatifid, with a narrow rachis and short lobes, intensely prickly, about 2 lines long. Flowers few, on branch-like prickly peduncles. Calyx exceedingly prickly, with lanceolate lobes. Corolla pale blue, divided to about the middle, armed outside with a few prickles like those of the calyx. (*R. Brown*.)

S. Australia. Petrel Bay, *R. Brown*. Brown's herbarium contains only a single specimen without flowers. It resembles *S. calaphractum*, but the prickles on the corolla described by Brown are wanting in that species, as indeed in every other Australian *Solanum* known to me. The above description of the flowers is taken from Brown's notes.

33. **S. cataphractum**, *A. Cam. Herb.* A diffuse shrub or undershrub, the under side of the leaves usually sprinkled with stellate hairs, the whole plant otherwise glabrous or nearly so except the corolla. Prickles straight, rather slender, very numerous on the stems, foliage, inflorescence, and calyxes. Leaves petiolate, sinuate-lobed or deeply pinnatifid, with broad or narrow sinuate lobes, the whole leaf 2 to 4 in. long. Flowers monocious, the males in pedunculate racemes, the females on solitary lateral pedicels. Flowering calyx not seen. Corolla violet, about $\frac{3}{4}$ in. diameter, scarcely lobed, tomentose outside. Anthers short, very obtuse. Fruiting pedicel thickened upwards, 1 in. long or more. Berry $\frac{3}{4}$ in. diameter, enclosed in the enlarged densely prickly calyx. Seeds large and black.

N. Australia. Bat Island and Regent river, N.W. coast, *A. Cunningham* (with linear-lanceolate leaf-lobes); Montagne Sound, *A. Cunningham* (with broad less deeply lobed leaves). The specimens are all in fruit only. I describe the flowers from Cunningham's notes and from a drawing of a plant formerly raised in Kew Gardens from his seeds. He distinguished the broad-leaved form as a species under the name of *S. pectinatum*.

34. **S. pungetium**, *R. Br. Prod.* 446. A diffuse herb, the branches foliage and inflorescence sprinkled with stellate hairs, without any glandular pubescence. Prickles slender but not very long, rather numerous on the branches, leaves, inflorescence, and calyxes. Leaves petiolate, from broadly ovate to almost oblong, irregularly sinuate-lobed, with short and broad but acute and sinuately toothed lobes, green on both sides, the larger leaves 2 to 4 in. long. Flowers lateral, solitary or 2 together, each on a slender pedicel without any common peduncle. Calyx 3 to 4 lines long, with narrow acuminate lobes, slightly enlarged when in fruit. Corolla of a bluish-violet, about $\frac{3}{4}$ in. diameter, with rather broad and short triangular lobes.—Dun. in DC. *Prod.* xiii. part i. 295.

Queensland. Bowen river, *Bowman*.

N. S. Wales. Port Jackson, *Banks and Solander*, *R. Brown*; Illawarra, *Buckhouse*.

Victoria. Broadribb river, *F. Mueller*.

This species resembles some forms of *S. armatum*, with which F. Mueller is disposed to unite it; but, besides the indumentum, the inflorescence pointed out by Brown appears to be constant. In *S. armatum*, when the raceme is reduced to 2 flowers, if one pedicel is sessile on the stem the other is always raised on a peduncle.

35. **S. eremophilum**, *F. Muell. in Linnaea*, xxv. 432. A perennial or undershrub, either small and diffuse or tall and erect, the branches foliage and inflorescence hirsute with stellate hairs but scarcely tomentose. Prickles rigid and rather long on the stem, leaves, and calyxes. Leaves petiolate, broadly ovate, obtuse, undulate and broadly sinuate-lobed, green on both sides, scarcely above 1 in. long in the specimens seen. Racemes short and few-flowered, the pedicels at length above $\frac{1}{2}$ in. long. Calyx broadly campanulate, about 3 lines long at the time of flowering, divided to below the middle into broadly lanceolate membranous lobes, much enlarged after flowering. Corolla about $\frac{3}{4}$ in. diameter, with broad acute lobes not reaching to the middle. Anthers tapering upwards. Berry globular, almost covered by the enlarged slightly prickly calyx.

N. S. Wales. Macquarrie river, *Bowman*.

S. Australia. Clayey somewhat saline pastures, Flinders Range, and between Rocky river and Rocky Creek, *F. Mueller*.

From each station I have seen only a single small specimen in Herb. *F. Mueller*.

36. **S. campanulatum**, *R. Br. Prod.* 446. A coarse erect herb (or undershrub?) of 2 to 3 ft., the branches foliage and inflorescence more or less hirsute with stellate or simple hairs mixed with a glandular pubescence. Prickles straight, rather slender, numerous on the stem, leaves and inflorescence, few and small on the calyxes. Leaves petiolate, ovate, sinuate-lobed, with short broad angular or sinuate lobes or rarely more deeply pinnatifid, green on both sides, 2 to 4 in. long. Flowers few, in loose lateral racemes, the pedicels at length above 1 in. long and distant along the common peduncle. Calyx 4 to 5 lines long, with subulate-acuminate lobes, enlarged in fruit and deeply divided into lanceolate acuminate segments. Corolla violet or blue, broadly campanulate or sometimes almost rotate, but always less open than in other Australian species, about 1 in. diameter, very shortly and broadly lobed. Anthers but slightly tapering upwards. Berry globular, $\frac{3}{4}$ to 1 in. diameter, surrounded by but not completely enclosed in the enlarged prickly calyx.—*Dun. in DC. Prod.* xiii. part i. 297; *Bot. Mag.* t. 3672.

Queensland. Araucaria Ranges, Burnet river, *Leichhardt* (apparently this species, but the specimen imperfect).

N. S. Wales. Port Jackson and Grose river, *R. Brown*; Currejong, *Woolfs*; New England, *C. Stuart*; Clarence river, *Beckler*.

37. **S. adenophorum**, *F. Muell. Fragm.* ii. 162. An erect perennial, sometimes under 1 ft. and from that to 2 ft. high, the branches foliage and inflorescence hirsute with simple or stellate hairs mixed with a glandular pubescence. Prickles slender, rather numerous on the branches, leaves, inflorescence, and calyxes. Leaves petiolate, ovate, sinuately lobed or pinnatifid with rather obtuse sinuate lobes, green on both sides, 2 to 4 in. long. Flowers rather small, pale blue or white, in loose racemes on rather long peduncles. Calyx 3 to 4 lines long at the time of flowering, deeply divided into narrow subulate-acuminate lobes, enlarged in fruit and the points then very long. Corolla glabrous or with a very few stellate hairs outside, about $\frac{1}{2}$ in. diameter, deeply divided into narrow lobes. Anthers rather long, tapering upwards. Berry whitish, globular, scarcely $\frac{1}{2}$ in. diameter.

Queensland. Barren hills between the Mackenzie and Dawson rivers, *F. Mueller* (with most of the leaves rather deeply lobed); Rockingham Bay, *Dallachy* (leaves mostly sinuate-toothed or shortly lobed).

38. **S. cinereum**, *R. Br. Prod.* 446. An erect undershrub, the branches and inflorescence stellate-tomentose. Prickles slender, numerous on the branches, leaves, inflorescence, and calyxes. Leaves petiolate, ovate or ovate-lanceolate, mostly acuminate, more or less deeply sinuate-lobed or pinnatifid, 2 to 5 in. long, green above and glabrous or sprinkled with a few minute stellate hairs, white underneath with a soft stellate often fleecose tomentum. Flowers blue, rather large, in pedunculate racemes often as long as the leaves, the pedicels at first short, much elongated in fruit. Calyx 3 to 4 lines long, somewhat enlarged after flowering, densely prickly, with acu-

minate lobes. Corolly nearly 1 in. diameter, with short broad acute lobes. Berry globular, $\frac{3}{4}$ to 1 in. diameter. —Dun. in DC. Prod. xiii. part i. 294.

N. S. Wales. Glose river, *R. Brown*; Haster's and Mackenzie rivers and Whinstone rocks on the skirts of Liverpool Plains, *Fraser*, *A. Cunningham*; Nepean river, *Fraser* (with the calyx less prickly); Gwydir river, *Isaacs*; near Bathurst, *Woods*.

S. elegans, Dun. Syn. Sol. 28, and in DC. Prod. xiii. part i. 335, from the detailed description, does not appear to me to differ from *S. cinereum*.

S. semiarmatum has sometimes the aspect of this species, but is readily known by the small calyx with short teeth and without prickles, and by the more numerous smaller flowers.

39. **S. lacunarium**, *F. Muell. in Trans. Phil. Soc. Vict.* i. 18, and in *Hook. Kew Journ.* viii. 166. A small perennial or undershrub, most of the specimens under 6 in. and none exceeding 1 ft., the branches inflorescence and under side of the leaves hairy with a minute stellate tomentum. Prickles rather numerous, usually red, on the branches, leaves, and calyxes. Leaves deeply pinnatifid, with distant oblong and short or narrow and long lobes, all very obtuse and entire or sinuate, the whole leaf 1 to 3 in. long, the upper surface glabrous or sprinkled with a few minute stellate hairs. Flowers not numerous, in loose pedunculate racemes often as long as the leaves. Calyx campanulate, about 2 lines long, with short broad lobes. Corolla rather above $\frac{1}{2}$ in. diameter, tomentose outside, deeply divided into acute lobes. Anthers tapering upwards. Berry globular, yellow, surrounded by the slightly enlarged calyx.

N. S. Wales. Desert of the Murray and Darling, *F. Mueller*, *Victorian Expedition*, and others.

40. **S. petrophilum**, *F. Muell. in Linnaea*, xxv. 433. A low spreading shrub or undershrub, the branches foliage and inflorescence covered with a dense soft stellate tomentum, often yellowish or rusty. Prickles rather slender, on the branches, leaves, and calyxes. Leaves ovate lanceolate or oblong, obtuse, much undulate and sinuate-lobed, thick and soft, mostly $\frac{3}{4}$ to 1 in. long. Flowers large, bluish, in terminal or lateral racemes, the pedicels at first very short and under $\frac{1}{2}$ in. when in fruit. Calyx about 4 lines long, deeply divided into narrow lobes, each with a very prominent midrib terminating in the point, and after flowering the scarcely enlarged calyx is often almost reduced to the 5 linear ribs. Corolla fully 1 in. diameter, with short and broad lobes. Anthers slightly tapering upwards. Berry depressed-globular, under $\frac{1}{2}$ in. diameter.

N. S. Wales. Mutanie Ranges, *Victorian Expedition*.

S. Australia. Dry rocky wastes about Lake Torrens, *F. Mueller*; Flinders Range, *Hawill's Expedition*; in the N.W. interior, *McDonald Stuart*; also probably this species, head of Spencer's Gulf, *R. Brown* (without flowers).

41. **S. diversiflorum**, *F. Muell. Eragm.* vi. 146. A straggling shrub or undershrub of 1 ft. or more, the branches foliage and inflorescence thickly covered with stellate hairs, not usually so soft as in the allied species, but sometimes floccose on the young leaves. Prickles very small or rarely long, few or numerous on the branches and leaves, often entirely wanting on the male flowers, longer and more dense on the fertile and fruiting calyx.

Leaves deeply pinnatifid, with oblong very obtuse entire or sinuate lobes, the whole leaf 1 to 2 in. long. Flowers in lateral racemes, often as long as the leaves, but as in several allied species usually sterile except the lowest one of each raceme, which is on a longer pedicel proceeding from the base of the peduncle. Calyx about 3 lines long, with lanceolate acuminate lobes, without prominent keels or midribs, enlarged and very prickly round the growing fruit. Corolla (about $\frac{3}{4}$ in. diameter?) with short broad lobes. Anthers tapering upwards. Fruit only seen young.

N. Australia. Upper Victoria river, *F. Muell.*; La Grange Bay, N.W. coast, *Marten*; Port Walcott, *Harper*.

The monoecious character upon which the specific name was founded is common to several of the following species as well as to the American and Asiatic group of *Melengena*, but appears to exist in a less degree in some other groups so as to be scarcely available, in the present state of our acquaintance with the genus, as a sectional distinction.

42. ***S. carduiforme***, *F. Muell. Fraga.* ii. 163. An erect herb of 1 to 3 ft. of a pale glaucous green, covered with a stellate tomentum rather loose on the branches, very short and not dense on both sides of the leaves. Prickles rather slender but long and very numerous on the branches, leaves, and especially on the female calyxes. Leaves narrow, irregularly pinnatifid, with rather narrow obtuse entire or sinuate lobes, the whole leaf 3 to 4 in. long. Sterile flowers numerous, in dense racemes on long lateral peduncles. Calyx at the time of flowering about 3 lines long, campanulate, with broad lobes. Corolla not large. Fertile flowers probably solitary on lateral peduncles, which are still very short in fruit. Fruiting calyx large, globular, very densely armed with long rigid prickles, enclosing a globular berry of $\frac{1}{2}$ in. or more.

N. Australia. Sandy and rocky banks of Nicholson river, Gulf of Carpentaria, *F. Muell.*

43. ***S. melanospermum***, *F. Muell. Fraga.* ii. 163. An erect shrub or undershrub of 1 to 3 (or 4?) ft., the branches foliage and inflorescence densely and softly stellate-tomentose. Prickles not very long, straight, rather numerous on the stem, few on the leaves, more abundant and stouter on the calyxes. Leaves petiolate, ovate, scarcely acute, thick and soft, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, rather deeply sinuate-lobed, with broad very obtuse lobes. Flowers not seen. Fruiting pedicels solitary, lateral, above 1 in. long. Berry yellow, globular, at least 1 in. diameter, surrounded by the large, almost membranous broadly lobed calyx, armed with stout prickles, at first closely appressed and almost covering the fruit, at length reflexed. Seeds large and black as in *S. calaphractum*.

N. Australia. Abel Tasman river, *F. Muell.* Like *S. calaphractum*, this is probably monoecious and of the *Melengena* group.

44. ***S. horridum***, *Dun. Syn. Sol.* 28, and in *DC. Prod.* xiii. part i. 296. Branches foliage and inflorescence very copiously woolly-hirsute with long loose stellate hairs of a yellowish or rusty colour. Prickles long straight and very numerous on the stem and leaves, usually rather smaller on the calyxes. Leaves on long petioles, ovate or ovate-lanceolate, acute or scarcely obtuse, entire or sinuate and often much undulate, 1 to 2 in. long. Pedicels in the

specimens seen solitary and lateral. Calyx about 3 lines long at the time of flowering, with narrow lobes, much enlarged afterwards and more deeply divided into ovate-lanceolate acuminate lobes. Corolla under $\frac{3}{4}$ in. diameter, with short broad lobes. Anthers tapering upwards. Berry large, globular, the enlarged calyx spreading under it and very prickly, but the prickles smaller than those of the stem and leaves.

N. Australia, *Bandin's Expedition* (*Herb. R. Ls.*), and apparently the same species, with rather broader more undulate leaves, Depuech Island, N.W. coast, *Bynoe*.

The species is, according to Dunal, also in Timor.

45. **S. echinatum**, *R. Br. Prod.* 447. An erect or diffuse undershrub, the branches foliage and inflorescence very densely and softly stellate-tomentose, often velvety or floccose. Prickles slender, rather small on the stems, few or none on the leaves, more abundant and longer on the calyxes. Leaves on rather long petioles, ovate-oblong or lanceolate, obtuse, entire or slightly sinuate, very thick and soft, mostly 1 to 2 in. long. Racemes lateral, loose, the common peduncle elongated. Flowering calyx 2 to 3 lines long, with short lanceolate lobes, very tomentose, with small prickles; when in fruit globular, membranous, very prickly, about $\frac{3}{4}$ in. diameter, completely enclosing the globular berry, the broad triangular lobes almost meeting over it. Corolla very tomentose, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, shortly and broadly lobed. — *Dun. in DC. Prod.* xiii. part i. 297.

N. Australia. N.W. coast, *Bynoe*; Upper Victoria river, *F. Muell*; islands of the Gulf of Carpentaria, *R. Brown*.

According to R. Brown the berry is almost 4-celled (*subquadrilocularis*), which I have been unable to verify in our specimens. In two flowers that I examined I found the ovary 2-celled only, but with slight indications of transverse spurious dissepiments, which may probably grow out as the fruit enlarges.

46. **S. lasiophyllum**, *Dun. in Poir. Dict. Suppl.* iii. 761, *not of Syn. Sol.* A stout rigid shrub or undershrub attaining 2 or 3 ft., the branches foliage and inflorescence very densely and softly stellate-tomentose. Prickles very slender and not long, few or numerous on the branches, few or none on the leaves, rarely wanting on the young calyx and always present on the fruiting one. Leaves very shortly petiolate, from ovate-oblong to nearly orbicular, very obtuse, entire or scarcely sinuate, very thick and soft, rarely 2 in. long and often under 1 in. Flowers few, large, in short dense racemes, the peduncle and pedicels thick and soft. Calyx very thick and woolly, with short thick narrow lobes, 3 to 4 lines long when in flower, enlarged afterwards. Corolla 1 to $1\frac{1}{2}$ in. diameter, very shortly and broadly lobed, the lobes generally with a short point. Anthers tapering at the end. Ovary 2-celled. Berry ovoid-globular, almost enclosed in the calyx, which is then globular and above $\frac{1}{2}$ in. diameter. *S. eriophyllum*, *Dun. Syn. Sol.* 30, and in *DC. Prod.* xiii. part i. 300; *F. Muell. Fragm.* vi. 145.

W. Australia. Sharks' Bay, *Milne*; Murchison river, *Oldfield*. The specimen of *Bandin's* in *Herb. Mus. Brit.* (probably from the W. not the E. coast), referred to by Dunal, has the leaves rather more sinuate than *Diamorpha's*. Dunal does not say for what reason he adopted Kunth's unpublished name of *S. lasiophyllum* for a S. American species, when his own, for the present species, had already been published by *Poiret* for three years.

Var. δ *crassissimum*. Leaves broad, almost orbicular, cordate at the base, 2 to 3 in.

diameter, excessively thick. Racemes longer; flowers and calyx the same but more woolly.

N. Australia. N.W. coast, *Bynoe*.

47. ***S. ellipticum*, R. Br. Prod.** 146. A shrub or undershrub, either very low and spreading or taller and erect, the branches foliage and inflorescence covered with a dense stellate tomentum, sometimes very thick soft and velvety or floccose, sometimes shorter and closer. Prickles slender, few or numerous on the stems and calyxes, few or none on the leaves. Leaves petiolate, from broadly ovate to ovate-lanceolate or oblong, obtuse, entire or slightly sinuate or undulate, rounded or cordate at the base, mostly 1 to nearly 3 in. long. Flowers in lateral racemes, often longer than the leaves, the pedicels usually short. Calyx-tube at the time of flowering 1 to 2 lines long, the lobes or teeth narrow and thick, from very short to fully twice as long as the tube; after flowering the calyx much enlarged and dividing into broad lobes with short or long narrow points. Corolla violet, with short broad lobes, apparently varying in size from about $\frac{1}{2}$ to above $\frac{3}{4}$ in. diameter. Ovary 2-celled. Berry globular, surrounded by but not enclosed in the enlarged calyx.—Dun. in DC. Prod. xiii. part i. 293; *S. lithophilum*, F. Muell. in Linnæa, xxv. 434.

N. Australia. Hammersley Range, N.W. coast, *Maitland Brown*; Sea Range and Sturt's Creek, *F. Mueller*.

Queensland. Broad Sound, *R. Brown*; near Peak Range, *Leichhardt*; Suttor desert, Dawson and Mackenzie rivers, *F. Mueller*; Rockhampton, *O'Shanassy*, *Dallaehy*; Suttor and Connor rivers and Nercool Creek, *Bowman*; Flinders river, *Sutherland*; Maranoa river, *Mitchell*; Armadillo, *Barton*.

N. S. Wales. Peele's Range, *Fraser*; Darling river, *E. Giles*; thence to the Barrier Range, *Victorian Expedition*; Mount Murchison, *Bonney*.

S. Australia. Flinders Range and Cudnaka, *F. Mueller*; near Spencer's Gulf, *Warburton*; in the interior, *M'Douall Stuart*; Cooper's River, *A. C. Gregory*; Lake Gillies, *Burkitt*.

W. Australia, *Drummond*, n. 87; Murchison river, *Oldfield*.

Var. *pannifolium*, A. Cunn. Tomentum ferruginous, very copious, almost woolly. Stems very prickly but not the leaves.—Cambridge Gulf, N.W. coast, *A. Cunningham*.

48. ***S. quadriloculatum*, F. Muell. Fragm.** ii. 161. An undershrub attaining several feet, the branches foliage and inflorescence densely and softly stellate-tomentose. Prickles straight, rather slender, long or short, few or many on the stems and calyxes, few or none on the leaves. Leaves petiolate, ovate or ovate-lanceolate, acute or acuminate, entire, very unequal at the base, thick and soft, 2 to 4 or even 5 in. long. Flowers small and numerous, in long lateral racemes (the upper ones sterile?), the pedicels rather short. Calyx-tube campanulate, under 2 lines long, with short or long soft points or lobes, enlarged after flowering and dividing into broad lobes with narrow points. Corolla above $\frac{1}{2}$ in. diameter, rather deeply lobed. Ovary 4-celled. Berry globular, surrounded by but not enclosed in the enlarged calyx, but not seen quite ripe.

N. Australia. Upper Victoria river and Nicholson river, Gulf of Carpentaria, *F. Mueller*; in the interior, lat. 22°, *M'Douall Stuart*.

49. ***S. phlomoides*, A. Cunn. Herb.** An undershrub or shrub, either

low and prostrate or erect and attaining $1\frac{1}{2}$ to 2 ft., very densely and softly woolly with stellate hairs. Prickles slender, few or numerous, as in *S. quadriloculatum*. Leaves as in that species ovate or ovate-lanceolate, mostly acuminate, 3 to 4 in. long, but thicker and softer. Flowers large, numerous, in long racemes, on very short thick pedicels. Calyx nearly $\frac{1}{2}$ in. long when in flower, rather deeply divided into narrow thick lobes, much enlarged afterwards, divided under the fruit into broad acuminate lobes at least 1 in. long and very open. Corolla 1 to $1\frac{1}{2}$ in. diameter, with short broad lobes. Berry depressed, globular, above 1 in. diameter.

N. Australia. Enderby island, N.W. coast, *A. Cunningham*; Hammersley Range, *MacLeod Brown*. I have been unable to examine the ovary, having found it destroyed by insects in the flowers I opened.

50. **S. Cunninghamii**, *Benth.* An under-shrub or shrub, from under 1 ft. to 4 or 5 ft. high, the branches foliage and inflorescence covered with a stellate tomentum, sometimes thick and floccose especially on the under side of the leaves, shorter and harsher on the upper side. Prickles few and small except on the calyx-tube. Leaves petiolate, lanceolate or almost ovate, rather obtuse, entire, 2 to 3 in. long, rather thick and soft. Pedicels in all the specimens seen 1-flowered, lateral, 1 to $1\frac{1}{2}$ in. long. Calyx-tube globular, not 3 lines long, densely armed with long prickles; lobes linear, almost terete, fully twice as long as the tube. Corolla large with acute or acuminate lobes, not well open in our specimens, but evidently above $1\frac{1}{2}$ in. diameter. Fruit not seen.

N. Australia. Cygnet Bay, N.W. coast, *A. Cunningham*, *Dysoe*; Glenelg district, *Marten*. The flowers are probably monocious, as in the *Melastomaceæ*, and, if so, the male or sterile flowers may be, as in other species, racemose and less prickly.

*2. NICANDRA, Gærtn.

Calyx of 5 distinct broadly cordate segments or sepals, becoming much enlarged and inflated in fruit. Corolla campanulate, with 5 broad short lobes, folded (and perhaps also slightly imbricated) in the bud. Anthers short, opening longitudinally. Ovary 3- to 5-celled. Fruit a berry, enclosed in the enlarged calyx. Embryo curved in a fleshy albumen.—An erect annual, with the habit and foliage nearly of *Physalis*.

The genus is limited to a single species.

*1. **N. physalodes**, *Gærtn.*; *Dun. in DC. Prod.* viii. part i. 434. An erect glabrous annual or biennial, attaining sometimes 5 or 6 ft., but usually smaller. Leaves petiolate, ovate, irregularly sinuate or coarsely toothed or lobed, 3 or 4 in. long or sometimes larger. Flowers pale blue, solitary, on short pedicels in the upper axils, forming a terminal leafy raceme. Calyx-segments at the time of flowering a little more than $\frac{1}{2}$ in. long and herbaceous, when in fruit above 1 in. long, thin and much veined, closely connivent, forming a vesicular calyx with very prominent angles. Corolla nearly 1 in. long. Berry globular.

N. S. Wales. A native of S. America, which has established itself as a weed in several parts of the warmer regions of the Old World, and has been received as such from various parts of N. S. Wales (*Herb. F. Mueller* and others).

3. **PHYSALIS**, Linn.

Calyx 5-toothed or 5-lobed, inflated after flowering. Corolla broadly campanulate or nearly rotate, 5-angled, folded in the bud. Anthers short, opening longitudinally. Ovary 2-celled. Berry globular, enclosed in the inflated calyx. Embryo circular or spiral round the fleshy albumen.—Herbs either annual or with a perennial stock. Leaves often in pairs. Flowers solitary, usually small, on axillary or lateral pedicels.

A genus rather numerous in America, of which two or three species, including the Australian ones, extend over the warmer regions of the Old World.

Stock perennial, the whole plant softly pubescent 1. *P. peruviana*.
Annual, sparingly pubescent. Flowers very small 2. *P. minima*.

*1. ***P. peruviana***, Linn.; Dun. in DC. Prod. xiii. part i. 440. A herbaceous perennial of 1 to 2 ft., softly pubescent or tomentose with simple hairs. Leaves petiolate, broadly ovate, acuminate, entire or slightly sinuate-toothed, mostly cordate at the base, 2 to 3 in. long. Pedicels short, rarely $\frac{1}{2}$ in. long even in fruit, recurved after flowering. Calyx when in flower about 3 lines long, with narrow lobes as long as the tube. Corolla rather above $\frac{1}{2}$ in. diameter, pale yellow with purple spots in the centre. Fruiting calyx vesicular, with connivent teeth, 1 to $1\frac{1}{2}$ in. long, reticulate with the principal veins prominent but not so angular as in *P. minima*. Berry globular, yellow.—Nees in Pl. Preiss. i. 344; *P. pubescens*, R. Br. Prod. 447, and of Linn. Herb. but not of Linn. Spec. Pl.; *P. edulis*, Sims, Bot. Mag. t. 1068.

N. Australia. Start river, F. Mueller.

Queensland. Brisbane river, F. Mueller.

N. S. Wales. Very common in the colony, R. Brown; Clarence river, Beckler.

S. Australia. Near Adelaide, Blandowski.

W. Australia. Cape Leschenault, Oldfield.

The species is of South American origin, and perhaps really indigenous in the islands of the Pacific, but long since cultivated for its berries, said to be edible, and established as a weed in several tropical countries, and therefore perhaps introduced only in Australia.

2. ***P. minima***, Linn.; Dun. in DC. Prod. xiii. part i. 445. An erect annual of about 1 ft., with spreading branches, more or less pubescent with scattered simple hairs. Leaves petiolate, ovate, acute or acuminate, irregularly sinuate-toothed or rarely entire, thin and membranous, mostly 2 to 3 in. long. Flowers very small, on filiform pedicels sometimes very short, sometimes above $\frac{1}{2}$ in. long. Calyx when in flower scarcely $1\frac{1}{2}$ lines long, with short acuminate teeth. Corolla about twice as long as the calyx, pale yellow, the centre often purple. Fruiting calyx about 1 in. long, vesicular, with 5 prominent angles and acuminate connivent teeth. Berry globular. *P. parviflora*, R. Br. Prod. 447; Dun. in DC. Prod. xiii. part i. 444, with some other supposed species enumerated by Dunal.

N. Australia. Victoria river, F. Mueller.

Queensland. Broad Sound and Keppel Bay, R. Brown; Moreton Bay, Leichhardt, F. Mueller; Rockhampton, O'Shaughy, Dallachy; Nerakool and Crocodile Creeks, Bowman; Rockingham Bay, Dallachy; Port Molle, M'Gillivray.

The species is dispersed over tropical America, Asia, and Africa, and very common in E. India.

4. **LYCIUM**, Linn.

Calyx with 5, rarely 4 teeth, often ultimately dividing into 3 to 5 lobes. Corolla more or less funnel-shaped, the tube expanding into a campanulate 5- rarely 4-lobed limb, the lobes imbricate in the bud. Stamens usually unequal, longer or shorter than the corolla; anthers opening longitudinally. Ovary 2-celled. Berry ovoid or globular. Embryo curved or semicircular, in a fleshy embryo.—Shrubs, usually glabrous, the branchlets often spinescent. Leaves entire, usually small, often clustered on the old nodes. Flowers pedicellate, solitary or several together at the ends of the branchlets or in the clusters of leaves.

The genus is widely spread over the temperate and subtropical regions of the world, especially numerous in S. America and S. Africa. The only Australian species is endemic.

1. **L. australe**, *F. Muell. in Trans. Phil. Soc. Viet.* i. 20, and *Fragm.* i. 83. A scrubby spreading glabrous shrub of 2 to 3 ft., the smaller branchlets often degenerating into spines. Leaves clustered at the old nodes, obovate spatulate or oblong, obtuse, thick and fleshy, not $\frac{1}{4}$ in. long. Flowers usually solitary at the nodes, on short recurved pedicels. Calyx scarcely 1 line long, with minute teeth. Corolla white (*F. Muell.*), about 5 lines long, the tube rather slender, gradually dilated upwards, with 5 rarely 4 ovate obtuse lobes of about 1 line in length. Filaments inserted near the base of the tube, the longest nearly as long as the corolla, hairy to about the middle.

N. S. Wales. Desert of the Murray and Darling, *F. Mueller, Hergott.*

S. Australia. Subsaline pastures on the Murray, *Behr, F. Mueller.*

The species has entirely the aspect of some of the small-leaved S. African ones.

L. chinense, Mill.; Dun. in DC. Prod. xiii. part i. 510, which includes *L. vulgare*, Dun. l. c. 509; Miers, *Illustr.* ii. 120. t. 70, a species much planted and now naturalized in various parts of Europe and Asia, is also sent as an introduced plant from Port Phillip by F. Mueller, and is in Leichhardt's collection. It is a tall glabrous shrub, with long, weak, recurved or pendulous branches. Leaves oblanceolate to obovate, $\frac{1}{2}$ to 1 in. long or even longer. Corolla with a very short tube and deeply-lobed campanulate limb, the lobes about 3 lines long. Stamens exserted.

5. **ANTHOTROCHE**, Endl.

Calyx broadly campanulate, 5- rarely 6-lobed. Corolla broadly campanulate, with 5 rarely 6 lobes, induplicate in the bud. Anthers reniform, 1-celled (the 2 cells completely confluent and opening in a single slit), turned outwards in the bud. Ovary 2-celled. Capsule small, smooth, opening in 4 valves. Embryo curved, in a fleshy albumen.—Shrubs, more or less tomentose with plumose or stellate hairs. Leaves rather small, obtuse, entire. Flowers solitary in the axils of the floral leaves.

The genus is endemic in Australia.

Flowers sessile, crowded on the branches, loosely woolly. Old leaves nearly glabrous

1. *A. pannosa.*

Flowers pedicellate, distant. Tomentum of the whole plant close or rather loose, usually rusty

2. *A. Walcottii.*

1. **A. pannosa**, *Endl. Nov. Stirp. Dec.* 7. An apparently erect shrub, the branches rather stout, terete, covered as well as the young shoots and calyxes with a woolly tomentum, consisting chiefly of plumose hairs mixed

with a few stellate ones. Leaves very shortly petiolate or almost sessile, ovate obovate or oblong, very obtuse, thick, $\frac{1}{2}$ to 1 in. long, nearly glabrous when full grown. Flowers sessile, solitary in the axils of small leaves, which are usually crowded in the axils of the upper leaves and ends of the branches. Calyx about $2\frac{1}{2}$ lines long, deeply divided into lanceolate lobes. Corolla dull purple, about 4 or 5 lines diameter, the lobes broad, obtuse, as long as or longer than the tube, reflexed when fully open, very pubescent outside. Filaments dilated and pubescent at the base, and closed over the ovary, then filiform and recurved, rather shorter than the corolla. Capsule enclosed in the persistent calyx, quite glabrous. Seeds usually very few, and sometimes only a single one ripening; testa reticulate, rugose, slightly coriaceous. —A. DC. Prod. xiii. part i. 676; Miers, Illustr. ii. App. 36. t. 86.

W. Australia, Roe (Endl. l. c.), Drummond.

2. **A. Walcottii**, F. Muell. Fragm. i. 123. An erect much-branched shrub of 1 to $1\frac{1}{2}$ ft., covered with a dense tomentum, sometimes very short and close, sometimes looser and almost floccose, usually rust-coloured, consisting, as in *A. pinnosa*, of plumose hairs, persistent on the leaves as well as on the rest of the plant. Leaves ovate obovate or orbicular, contracted into a petiole more prominent than in *A. pinnosa*, very obtuse, $\frac{1}{2}$ to 1 in. long or in some specimens all under $\frac{1}{2}$ in. Flowers scattered along the branches, solitary in the axils, on pedicels at least half as long as the leaves, smaller than in *A. pinnosa*, but otherwise similar. Calyx about 2 lines long, with obtuse lobes. Corolla dark purple. Filaments very hispid at the base.

W. Australia. Murchison river, Oldfield, Drummond; Dirk Hartog's Island, Milne.

6. DATURA, Linn.

Calyx tubular, circumsiss near the base after flowering. Corolla funnel-shaped, with a long tube and a broad 5-angled or 5-toothed limb, folded in the bud. Ovary 2-celled, each cell incompletely divided into two. Fruit an ovoid or globular capsule, opening in 4 short valves, and usually beset with prickles. Embryo curved round a fleshy albumen. — Tall coarse herbs, or, in S. American species, shrubs or soft-wooded trees. Leaves alternate, often in pairs. Flowers solitary, terminal or lateral, usually very large.

A small genus, chiefly American, with two or three species equally common in, and perhaps indigenous to, the Old World. The only Australian species is endemic, at least in its Australian form.

1. **D. Leichhardtii**, F. Muell. in Trans. Phil. Soc. Vict. i. 20. An erect annual of 1 to 3 ft., sparingly pubescent. Leaves petiolate, ovate, acute or shortly acuminate, irregularly sinuate-toothed or lobed, mostly 3 to 4 in. long. Flowers of a pale yellowish-white, on short peduncles either terminal or in the forks, and recurved after flowering. Calyx scarcely above 1 in. long. Corolla about twice as long as the calyx, the angles produced into short points. Capsule reflexed, globular, about 1 in. diameter, very prickly, resting on the broadly expanded persistent base of the calyx. — *D. alba*, F. Muell. Fragm. vi. 144, but scarcely of Nees.

N. Australia. Gulf of Carpentaria, Leichsborough; Ashburton river, Walcott.



Queensland. Gilbert river, *F. Mueller*; Comet river, *Leichhardt*; Sutor river, *Dorsay*; Rockingham Bay, *O'Shanesy*; Armadillo, *Barton*.

The very common East Indian *D. alba*, Nees, or *D. Metel*, Roxb., has the flowers fully twice as large as *D. Leichhardtii*, and the leaves more entire. The Australian plant has more the aspect of the common *D. Stramonium* or of *D. ferax*, with the small flowers of the latter, but differs from both in the reflexed capsule.

D. Tatula, Linn. Sp. Pl. 256; Sweet, Brit. Fl. Gard. t. 83, regarded by Dunal and most authors as a variety of *D. Stramonium* with blue flowers, but whose claims to be retained as a species have been recently again brought forward by Naudin's hybridizing experiments, has appeared in Australia as an introduced weed.

7. NICOTIANA, Linn.

Calyx campanulate, 5-lobed, persistent. Corolla with a cylindrical tube, the limb more or less spreading, 5-lobed, induplicate or folded in the bud. Stamens 5, included in the tube, often unequal; anthers 2-celled, opening longitudinally. Ovary 2-celled; stigma broadly 2-lobed. Fruit a capsule opening in 2 bifid valves parallel to the dissepiment which remains attached to the axis. Seeds numerous. Embryo slightly curved, in a fleshy albumen. — Herbs usually erect and coarse. Leaves alternate, entire. Flowers white greenish-yellow or dull-red, in terminal racemes often branching into very loose panicle-like cymes.

The genus is entirely American, with the exception of the single Australian species, which, however, is scarcely to be distinguished from a S. American one, and of one nearly allied to it from the S. Pacific islands. Some species, long cultivated under the name of *Tobacco*, have become almost naturalized in the warmer regions of the Old World, but we have as yet seen no Australian specimens. F. Mueller's collection contains, however, as an escape from gardens, a specimen of *N. glauca*, Griseb. in Bot. Mag. t. 2837, a perfectly glabrous glaucous species, with rather slender tubular flowers of a greenish yellow, with a very small limb.

1. *N. suaveolens*, *Lehm. Hist. Nicot.* 43. An erect annual or biennial of 1 to 2 ft., more or less pubescent or villous and usually viscid. Lower leaves on long petioles, ovate or spatulate, the upper ones usually narrow and sessile although contracted at the base, but exceedingly variable, sometimes all cordate and the upper small ones clasping the stem, sometimes all narrow with very few on the stem, the petiole in some specimens dilated at the base, and stem-clasping or shortly decurrent. Flowers sweet-scented, especially at night, of a pure white or greenish outside, in loose terminal racemes often branching into irregular panicles, and exceedingly variable in size, on short or long pedicels. Bracts usually small and linear or none under the upper pedicels, but sometimes all larger and leafy. Calyx varying from 3 to 6 lines long, the lobes usually very narrow and as long as the tube. Corolla-tube slender or broad, varying from $\frac{1}{2}$ in. to 2 in. in length, usually slightly swollen under the throat; limb spreading flat, from $\frac{1}{2}$ to 1 in. diameter, the lobes short and broad, emarginate obtuse or almost acute, the 2 upper ones usually rather smaller than the others. Filaments adnate high up; anthers ovate or oblong, 4 usually at the throat of the corolla, the fifth much lower down. Capsule ovate, slightly acuminate, rather shorter than the calyx-lobes. Seeds very small and numerous. — *Dun. in DC. Prod.* xiii. part i. 565; *N. undulata*, Vent. Jard. Malm. t. 10; Bot. Mag. t. 673; R. Br. Prod. 447; *N. Australasie*, R. Br. in Tuck. Cong. App. 472, Misc. Works, ed. Benn. i.

158; *N. rotundifolia*, Lindl. Bot. Reg. 1838, Misc. 59; *N. fastigiata*, Nees in Pl. Preiss. i. 343.

N. Australia. N.W. coast, *Bynoe* (with broad cordate leaves); Nickel Bay, *Gregory's Expedition* (with small narrow leaves).

Queensland. Rockhampton and Rockingham Bay, *Dallachy*; Bowen river, *Bowman*; in the interior, *Mitchell*; Curriwillighi and Armadillo, *Dalton*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; Macleay and Hastings rivers, *Beckler*; southward to Kiana, *Harvey*; in the interior from Lachlan and Darling rivers to the Barrier Range, *Victorian and other Expeditions*.

Victoria. Port Phillip, *Gunn*; Murray river, *F. Mueller*; near Ballarat, *H. W. Locker*.

S. Australia. Head of Spencer's Gulf, *R. Brown*; Murray river, *F. Mueller*; Torrens river, *Whittaker* (very hirsute, with broad leaves and decurrent auriculate petioles); Lake Gillies, *Burkett*; abundant at Wills Creek, *Howitt's Expedition*.

W. Australia. *Drummond*; Murchison and Blackwood rivers, *Oldfield*.

I cannot readily distinguish the species from the Chilean *N. acuminata*, Griseb., which is perhaps again the same as *N. angustifolia*, Ruiz and Pav., from the same country. In Australia it varies exceedingly both in foliage and flowers, the most marked forms I have seen are the following:—

Var. parviflora. Corolla much under 1 in. long. Leaf-petioles sometimes auriculate, sometimes not. Panicle large and loose.—Queensland and northern part of N. S. Wales.

Var. longiflora. Corolla-tube at least 2 in. long. Leaves various.—In the interior of Queensland and N. S. Wales.

Var. cordifolia. Leaves almost all cordate. Calyx large with broad lobes. Corolla of the common size (1 to 1½ in. long).—N.W. coast, *Bynoe*.

N. Neesii, Lehm. in Pl. Preiss. i. 344, from W. Australia, which I have not seen, is probably a variety of the same species, remarkable for the stem, especially near the base, being densely covered with white wool.

ORDER LXXXIII. SCROPHULARINEÆ.

Flowers irregular or seldom nearly regular. Sepals 5, either free or more frequently united in a toothed or lobed calyx. Corolla usually 2-lipped, but sometimes nearly regular, with 5 or rarely 4 or more than 5 lobes, more or less imbricate, and in one tribe folded in the bud. Stamens usually 2 or 4, in pairs, inserted in the tube and alternating with the lower lobes of the corolla; the fifth stamen, between the 2 upper lobes, usually deficient or rudimentary or sterile, very rarely perfect; anthers 2-celled or 1-celled by the confluence of the cells or by the abortion of one of them, the cells opening longitudinally. Ovary 2-celled, with several ovules in each cell, attached to a single placenta in the centre of the dissepiment. Style simple with a 2-lobed or rarely entire stigma. Fruit a 2-celled capsule or very rarely an indehiscent berry. Seeds with more or less of albumen, the testa usually reticulate or tubercular-rugose, sometimes crustaceous. Embryo straight or rarely curved.—Herbs or rarely shrubs or small trees. Leaves usually opposite (or verticillate) in the lower part of the plant, alternate higher up, but sometimes all alternate or all opposite, without stipules. Flowers in terminal racemes or cymes, or the lower ones, rarely all, axillary. Bracts small or none besides the floral leaves, bracteoles very rare.

A large Order widely dispersed over every part of the globe. Of the thirty Australian genera, fourteen belong to the tropical Asiatic flora, several of them extending into Africa,

and a few species occurring also (probably introduced) in S. America, five are tropical, both in the New and the Old World, five are chiefly American and Andine or extratropical, of which two are also represented in the mountains of tropical Asia, two belong chiefly to the extratropical flora of both hemispheres, and only four are endemic in Australia.

The Order is closely allied to *Solanaceæ*, differing chiefly in that irregularity of flower which connects it with *Bignoniaceæ*, *Acanthaceæ*, *Verbenaceæ*, and others of the personate or bilabiate group, and which is evidenced in *Scrophularinaceæ*, either by the didynamy of the stamens or by the bilabiate aestivation of the corolla, or, in most cases, by both characters.

SUBORDER I. Salpiglossidæ.—*Corolla 5-lobed, the lobes induplicate or folded in the bud. Stamens in the Australian genera 1, didynamous. Inflorescence centrifugal, (often irregular in the Australian genera).*

- Fruit a berry. Anthers 1-celled 1. DUBOISIA.
Fruit a capsule. Anthers 1- or 2-celled 2. ANTHOCERCIS.

SUBORDER II. Antirrhinidæ.—*Corolla 5-lobed or 2-lipped, imbricate in the bud, the upper lip or 2 upper lobes outside. Inflorescence centripetal or, in genera not Australian, compound. (Estivation uncertain in some of the minute-flowered Limnaceæ.)*

TRIBE *. Verbasceæ.—*Corolla rotate. Stamens declinate. Anthers 1-celled. Erect coarse herbs with alternate leaves.*

- Stamens 5 *. VERBASCUM.
Stamens 4 *. CELSIA.

TRIBE *. Antirrhinæ.—*Corolla tubular at the base, the tube produced into a spur or protuberance. Stamens ascending, included in the tube. Capsule opening in pores or detached opercula. Lower leaves or all opposite.*

- Corolla spurred (prostrate pubescent annual) *. LINARIA.

TRIBE. Gratiolæ.—*Corolla tubular at the base, neither spurred nor gibbous. Stamens shorter than the corolla, ascending. Capsule opening in 2 or 4 valves, or very rarely indehiscent.*

SUBTRIBE 1. Eugratiolæ.—*Leaves, at least the lower ones, opposite. Stamens all inserted in the tube and (in the Australian genera) entirely included. Capsule (in the Australian genera) opening loculicidally in 2 entire or bifid valves or 4-valved, or septical with bifid valves.*

Stamens 4, all perfect.

- Calyx tubular, 5-angled, 5-toothed. Anther-cells contiguous . . . 3. MIMULUS.

- Calyx campanulate, 5-lobed. Anther-cells contiguous . . . 4. MAZUS.

Calyx divided to the base or nearly so. Anther-cells more or less stipitate or separated from each other.

Dissepiment of the capsule splitting and forming the inflexed margins of the valves, leaving the two placentas free and separate.

- Anthers of the longer stamens 1-celled. 5. ADENOSMA.

- Anthers all 2-celled 6. STEMODIA.

Dissepiment of the capsule splitting, but leaving the placentas consolidated in a single column 7. MORGANIA.

Dissepiment of the capsule remaining entire, at least at the base, and forming wings to the placental column . . . 8. LIMNOPHILA.

- Calyx divided to the base, the outer segment much broader than the others. Anther-cells contiguous 9. HERPESTIS.

Stamens 2 perfect, the 2 lower ones reduced to filiform staminodia or entirely deficient.

- Calyx divided to the base. Capsule 4-valved, leaving the placentas consolidated in a single column 10. GRATIOLA.

- Calyx campanulate, 5-lobed. Capsule 2-valved, bearing the separate placentas in their centre 11. DOPATRIUM.

SUBTRIBE 2. **Linderniæ**.—*Stem-leaves opposite. Upper stamens perfect and included in the tube. Lower stamens inserted in the throat, either reduced to staminodia or with long arched filaments with an angle or small lobe or appendage near the base, the anthers contiguous or cohering under the upper lip. Capsule opening in 2 entire valves parallel to the dissepiment.*

Perfect stamens 4.

Calyx deeply divided into herbaceous segments, dilated and imbricate at the base. Flowers large. Appendage to the lower stamens broad and flat 12. **ARTANEMA**.

Calyx deeply divided into linear segments, sometimes cohering in a 5-toothed calyx (not angular as in *Torenia*). Appendage to the lower stamens linear 13. **VANDELLIA**.

Perfect stamens 2. Staminodia 2. Calyx divided to the base.

Staminodia acute with an angle tooth or lobe near the base.

Capsule globular or broadly ovoid 14. **ILYSANTHES**.

Staminodia linear and obtuse, entire. Capsule oblong or linear. 15. **BONNAYA**.

SUBTRIBE 3. **Limosellæ**.—*Small creeping or prostrate herbs with opposite or clustered leaves. Corolla (minute) with a short tube and 5 nearly equal lobes (activation variable?). Anthers 1-celled. Capsule various.*

Calyx 5-toothed. Stamens 2. Leaves opposite.

Capsule indehiscent or bursting irregularly or obscurely 4-valved 16. **PEPLIDIUM**.

Capsule loculicidally 2-valved 17. **MICROCARPÆA**.

Calyx obtusely 3- or 4-lobed. Stamens 2 or 4. Capsule loculicidally 2-valved. Leaves opposite 18. **GLOSSOSTIGMA**.

Calyx 5-toothed. Stamens 4. Leaves clustered or alternate.

Capsule opening in 2 valves parallel to the dissepiment . . . 19. **LIMOSELLA**.

SUBORDER III. **Rhinanthidæ**.—*Corolla either with 4, 5 (or rarely more in genera not Australian) spreading lobes, variously imbricate in the bud, the upper ones very rarely outside, or 2-lipped with the upper lip inside. Inflorescence centripetal or very rarely in genera not Australian compound.*

Leaves all alternate. Calyx 5-cleft to the base. Corolla deeply

5-lobed. Stamens 4 or 5. Anthers 2-celled, sagittate . . . 20. **CAPRARIA**.

Leaves, at least the lower ones, opposite.

Corolla rotate, 4-lobed. Stamens 4. Anthers equally 2-celled, sagittate 21. **SCOPARIA**.

Corolla rotate or with a distinct tube, 4-lobed. Stamens 2, exserted; anthers with confluent cells, not mucronate . . . 22. **VERONICA**.

Corolla with a distinct tube or broadly campanulate, lobes 5, nearly equal. Stamens 4.

Calyx deeply 5-lobed. Anthers with confluent cells, not mucronate 23. **OURISIA**.

Calyx 5-toothed or shortly 5-lobed. Anthers with one large scarcely mucronate cell and one stipitate empty cell . . . 24. **SOPUBIA**.

Calyx herbaceous, split on one side. Anther-cells unequal, mucronate or awned 25. **CENTRANTHERA**.

Corolla with a distinct tube, often long, the limb 2-lipped.

Corolla-tube slender. Stamens 4. Anthers with 1 vertical usually linear obtuse cell.

Corolla-tube straight. Capsule obtuse 26. **BUCHNERA**.

Corolla-tube bent above the middle. Capsule obtuse . . . 27. **STRIGA**.

Corolla-tube elongated. Capsule acuminate, the beak often oblique 28. **RIIAMPHICARPA**.

Corolla-tube slender. Stamens 2. Anthers with one large mucronate or aristate cell 29. **HEMIARRHENA**.

Corolla-tube not very slender. Stamens 4. Anther-cells equal, both mucronate 30. **EUPHRASIA**.

The introduced plants belonging to the genera marked above with the asterisk *, are the following, all European weeds:—

Verbascum Blattaria, Linn.; Benth. in DC. Prod. x. 230. An erect coarse simple or scarcely branched biennial of 2 to 3 ft., either glabrous or slightly glandular-pubescent in the upper part. Leaves alternate, oblong, coarsely toothed or sinuate, the lower ones petiolate, the upper ones sessile and sometimes slightly decurrent. Flowers yellow or rarely white, in a long loose simple raceme, on pedicels of 3 to 6 lines. Calyx deeply 5-lobed. Corolla rotate, with 5 broad rounded lobes. Stamens 5, declinate, the filaments woolly with purple hairs; anthers 1-celled. Capsule 2-valved, with numerous small seeds.—N. S. Wales, Victoria, and S. Australia. *V. virgatum*, With.; Benth. in DC. Prod. x. 229, perhaps a variety of *V. Blattaria*, differs in the greater abundance of the glandular pubescence and in the pedicels of the flowers very short, usually from 2 to 6 together within each bract. Victoria.

Celsia erecta, Linn.; Benth. in DC. Prod. x. 244. An erect biennial with much the habit of *Verbascum Blattaria*, pubescent and more or less viscid. Lower and radical leaves lyrate-pinnatifid, upper ones cordate and stem-clasping. Flowers yellow, larger than in *Verbascum Blattaria*, sessile within each bract, in a long terminal loose spike. Calyx divided into 5 broad serrate segments. Corolla rotate. Stamens 4, declinate, the 2 upper ones with woolly filaments and short reniform anther, the 2 lower with much longer glabrous filaments and linear adnate anthers. Capsule 2-valved.—Naturalized on Bichan river and Plenty Creek, Victoria, *P. Mueller*.

Linaria Clative, Mill.; Benth. in DC. Prod. x. 268. A prostrate hairy annual with slender stems. Leaves alternate or the lower ones opposite, nearly sessile, ovate and mostly angular or hastate at the base. Flowers small, solitary on slender pedicels in the axils of the upper small leaves. Calyx divided into 5 linear-lanceolate segments. Corolla yellowish, the tube produced into a straight spur at the base, the throat closed by a projecting *gublate*, the upper lip 2-lobed and purplish, the lower lip 3-lobed. Capsule opening on each side by the falling off of a circular valve-like operculum. Established in cultivated places about Paramatta, *Woolfs*.

SUBORDER I. SALPIGLOSSIDEÆ.—Corolla 5-lobed, the lobes more or less induplicate or folded in the bud and sometimes also slightly imbricate, the 2 upper ones (those next to the main axis of inflorescence) outside. Embryo often slightly curved. Inflorescence centrifugal.

As already observed in De Candolle's 'Prodromus,' this suborder might almost equally well be referred to *Solanaceæ*, to several genera of which it is closely allied, but the stamens are constantly didynamous, with the fifth upper one reduced to a sterile staminodium or more frequently to a mere rudiment or entirely wanting. Miers proposes to unite it with several *Solanaceæ* in an intermediate Order, *Atrapezaceæ*, but that appears to me rather to increase the difficulty of giving definite distinctive characters without establishing a more natural distribution. He considers, moreover, the two following Australian genera as forming with *Anthotroche* a very distinct tribe, remarkable for its reniform extrorse anthers, but unilocular reniform anthers occur in many Scrophularineous genera of other tribes, and, if examined in the bud, they are decidedly extrorse in several species at least of *Petunia* and *Nicotiana*. *Anthotroche* also, notwithstanding a similarity in anthers, differs essentially from *Duboisia* and *Anthocercis* in inflorescence and in the perfect regularity of the flowers and equal development of the five stamens.

1. DUBOISIA, R. Br.

Calyx 5-toothed. Corolla ovate-campanulate, the lobes broad, induplicate in the bud. Stamens 4, didynamous, included in the tube, the upper ones the longest, the fifth uppermost one reduced to a minute rudiment; anthers reniform, turned outwards at least when fully out, the cells confluent at the apex. Stigma slightly dilated and 2-lobed. Fruit an indehiscent berry. Seeds few, curved, with a crustaceous tubercular-rugose testa; embryo

curved, the albumen not copious.—Small glabrous tree. Leaves alternate, entire. Flowers small, in terminal centrifugal panicles.

The genus is, as far as known, limited to a single species extending from E. Australia to New Caledonia, but it is not improbable that *Anthocercis Leichhardtii*, of which the fruit is unknown, may prove to be a second *Duboisia*.

1. **D. myoporoides**, *R. Br. Prod.* 448. A tall shrub or small tree, quite glabrous. Leaves alternate, from obovate-oblong to oblong-lanceolate, obtuse or rarely acute, entire, contracted into a petiole, 2 to 4 in. long. Panicles terminal, sometimes leafy at the base, usually much branched, broadly pyramidal or corymbose. Bracts minute. Calyx broadly campanulate, with broad obtuse teeth. Corolla about 2 lines long, white or pale lilac, the lobes rather short and obtuse. Stamens included in the tube. Berry small, nearly globular. *Endl. Iconogr.* t. 77; *Benth. in DC. Prod.* x. 191; *Miers, Illustr.* t. 87; *Notelæa ligustrina*, *Sieb. Pl. Exs.*

Queensland. Brisbane river, Moreton Bay, *Fraser, F. Mueller*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 259, and many others; Sydney woods, Paris Exhibition, 1857, *M'Arthur*, n. 81; Hastings and Clarence rivers, *Beckler*; Port Macquarie, *Fraser*; Richmond river, *Henderson*; southward to Illawarra, *A. Cunningham, Ralston*.

The species is also in New Caledonia.

2. ANTHOCERCIS, Labill.

(*Cyphanthera*, *Miers*; *Eadesia*, *F. Muell.*)

Calyx 5-toothed or 5-lobed. Corolla-tube campanulate, shortly contracted at the base; lobes 5, spreading, nearly equal or the 2 upper rather shorter or longer than the others, all induplicate in the bud and the 2 upper slightly overlapping the lateral ones. Stamens 4, didynamous, included in the tube, with occasionally a small rudiment of the uppermost fifth one. Anthers 1- or 2-celled, turned outwards in the bud. Stigmatic lobes very short, rather broad. Capsule oblong ovoid or globular, opening in 2 entire or bitid valves. Seeds usually somewhat curved, with a reticulate crustaceous testa. Embryo straight or slightly curved, in a copious albumen.—Shrubs, sometimes almost arborescent, glabrous glandular-pubescent or hoary with a stellate tomentum. Leaves entire or rarely toothed, often rather thick. Peduncles 1- to 3-flowered, irregularly arranged in terminal racemes or panicles often leafy. Bracts very small or none. Corolla white or yellow, the tube usually streaked inside with purple or green.

The genus is limited to Australia. As a whole it is a very natural one, immediately connected with none except *Duboisia*, from which it differs solely in the capsular fruit. The two sections are very readily distinguished by a constant and absolute character, but appear to be too artificial to be conveniently adopted as genera as proposed by *Miers*. The authors in the one are those of *Petunia*, in the other 1-celled as in *Duboisia*.

SECT. I. Euanthocercis.—Anthers 2-celled, the cells not confluent. Plants glabrous or glandular-pubescent, without stellate hairs.

Plant quite glabrous (often viscid).

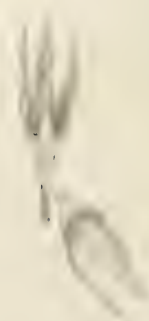
Leaves obovate, conspicuously glandular-dotted. Corolla large,

white. 1. *A. viscosa*.



Am. Virginica
Willd.

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- Leaves obovate or oblong-cuneate, not dotted. Corolla yellow, with narrow lobes 2. *A. littorea*.
- Leaves linear, usually few and small. Corolla rather small, with narrow linear lobes.
- Branches virgate, not spinescent 3. *A. gracilis*.
- Branches intricate, with numerous divaricate spines (reduced branchlets) 4. *A. genistoides*.
- Upper part of the plant, or at least the pedicels and calyx, glandular-pubescent.
- Corolla-lobes acute, longer than the tube.
- Leaves shortly cuneate, glandular-pubescent. Branches intricate, rigid, spinescent 5. *A. anisantha*.
- Leaves linear-cuneate, glabrous or nearly so. Branches intricate. Internodes distant. Branchlets occasionally spinescent 6. *A. intricata*.
- Leaves rather crowded. No spines 7. *A. arborea*.
- Leaves narrow-linear, almost acute, glandular-pubescent.
- Branches virgate or pauculate 8. *A. angustifolia*.
- Corolla-lobes obtuse, shorter than the tube. Leaves oblong-linear or oblanceolate 9. *A. fasciculata*.
- SECT. II *Cyphanthera*.—Anthers 1-celled. Plants glabrous glandular-pubescent or stellate-tomentose.
- Branches and leaves glandular-pubescent. Pedicels solitary, terminal or leaf-opposed. Corolla-lobes broad and obtuse.
- Much branched small shrub. Leaves under 1 line long 10. *A. microphylla*.
- Diffuse undershrub. Leaves 2 to 6 lines long 11. *A. rugosulcata*.
- Branches and leaves pubescent or tomentose with stellate hairs. Corolla-lobes narrow, acute.
- Leaves under $\frac{1}{2}$ in. long, scabrous-pubescent. Pedicels filiform, solitary, terminal or leaf-opposed 12. *A. scabrella*.
- Leaves $\frac{1}{4}$ to $\frac{1}{2}$ in. long, tomentose. Pedicels short, often several together, terminal or in the upper axils 13. *A. albicans*.
- Leaves $\frac{3}{8}$ to 1 $\frac{1}{2}$ in. long, tomentose. Pedicels short, often several together, terminal or in the upper axils 14. *A. tasmanica*.
- Leaves glabrous, young branches minutely tomentose or almost glabrous. Leaves mostly under 2 in. long. Flowers in irregular leafy racemes or narrow panicles.
- Leaves oblong or lanceolate. Corolla-lobes narrow, acute 15. *A. Eadesii*.
- Leaves linear. Corolla-lobes broad, obtuse 16. *A. racemosa*.
- Leaves and branches quite glabrous. Leaves 2 to 4 in. long. Flowers paniculate.
- Leaves linear. Corolla-lobes broad, obtuse 17. *A. Hopwoodii*.
- Leaves oblong or lanceolate. Corolla-lobes narrow, acute 18. *A. Leichhardtii*.

SECT. I. *EUANTHOCERCIS*.—Anthers 2-celled, the cells not confluent. Plants glabrous or glandular-pubescent, without stellate hairs. Capsule usually ovoid oblong or acuminate. Species all western, one of them extending into S. Australia.

1. *A. viscosa*, R. Br. *Prod.* 148. An erect shrub, usually of 6 to 8 ft., but attaining sometimes 20 ft. (*P. Mueller*), glabrous in all our specimens and more or less viscid. Leaves broadly obovate, entire or minutely scabrous-denticulate especially when dry, contracted into a short petiole, rather thick, marked with conspicuous glandular dots, mostly $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long. Peduncles 1- to 3-flowered, shorter than or exceeding the leaves. Flowers white, much larger than in any other species. Calyx-tube about 2 lines

long; lobes lanceolate, longer than the tube. Corolla-tube about $\frac{3}{4}$ in. long, streaked inside with green; lobes ovate to lanceolate, very spreading, about as long as the tube, but variable. Anthers 2-celled. Capsule acuminate, slightly exceeding the calyx, the valves entire or shortly split at the end. — Benth. in DC. Prod. x. 191; Bartl. in Pl. Preiss. i. 341; F. Muell. Pragm. vi. 143; Bot. Mag. t. 2961; Bot. Reg. t. 1624; Maund, Botanist, t. 59; Miers, Illustr. t. 82; *A. littorea*, Endl. Iconogr. t. 68, not of Labill. (the denticulations of the leaves much exaggerated).

W. Australia. King George's Sound, *R. Brown*, *Drummond*, n. 493, *Preiss*, n. 1963, and many others. Said to be one of the poison plants (*F. Mueller*).

2. ***A. littorea***, *Labill. Pl. Nov. Holl.* ii. 19. t. 158. A glabrous often slightly viscid shrub of from 2 to 8 ft. Leaves from oblong-cuneate to obovate, but usually narrower and smaller than in *A. viscosa*, more sessile, and without the glandular dots of that species, quite entire or the lower ones marked with a few prominent teeth, mostly $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, usually rather thick. Flowers yellow, often numerous, on slender but short pedicels, forming at the ends of the branches irregular leafy racemes or narrow panicles often more or less developed into terminal branching leafless panicles of 1 ft. or more. Calyx-tube scarcely 1 line long; lobes narrow, acute, shorter or longer than the tube. Corolla variable in size, the tube usually 3 to 4 lines long, streaked inside with purple; lobes narrow, acute, from rather longer than the tube to twice as long. Anthers 2-celled. Capsule narrow, acuminate, often $\frac{1}{2}$ in. long, the valves usually entire. — R. Br. Prod. 118; Benth. in DC. Prod. x. 191; Lehm. in Pl. Preiss. ii. 237; Bot. Reg. t. 212; Sweet, Fl. Austral. t. 17; Maund, Botanist, t. 102; Miers, Illustr. t. 83.

W. Australia. King George's Sound, *Labillardière*, *R. Brown*, *F. Mueller*, and others; eastward to Goose Island Bay, *R. Brown*, and to Cape Arid and Point Malcolm, *Maxwell*; Swan River, *Fraser*, *Drummond*, 1st Coll., *Preiss*, n. 1473, 1474; Murchison river, *Oldfield*.

A. ilicifolia, Hook. Bot. Mag. under n. 2961 and t. 1200; Benth. in DC. Prod. x. 192; Lehm. Pl. Preiss. ii. 237; Miers, Illustr. t. 83, from Swan River, has the leaves more toothed, the panicle more developed, and the flowers rather smaller than usual, but in all these respects the southern as well as the Swan River specimens are very variable.

A. glabella, Miers, Illustr. ii. App. 26, from Swan River, *Gilbert*, n. 126, appears to me to be a narrow-leaved form of *A. littorea*, with very long narrow corolla-lobes.

3. ***A. gracilis***, *Benth. in DC. Prod.* x. 192. Stems apparently tall, erect, slender, virgate and paniculately branched. Lower leaves unknown, upper ones very narrow, linear, a few at the base of the branches $\frac{1}{2}$ to 1 in. long, otherwise all very small and distant. Flowers not very numerous, on filiform pedicels. Calyx-tube about 1 line long; lobes narrow, as long as the tube. Corolla-tube under 3 lines long, the narrow base longer in proportion to the broad part than in most species; lobes filiform, much longer than the tube. Anthers 2-celled. Capsule acuminate. — Miers, Illustr. t. 83.

W. Australia. Swan River, *Drummond*, 1st Coll.

4. ***A. genistoides***, *Miers, Illustr.* ii. App. 27. t. 83. An erect glabrous shrub of 3 or 4 ft., with numerous intricate flexuose branches, the smaller

branchlets reduced to rigid divaricate spines. Leaves very small, linear, often reduced to small scales and rarely $\frac{1}{2}$ in. long. Pedicels solitary or 2 or 3 together in the axils of the spines, filiform but short. Calyx-tube about 1 line long, small or rarely as long as the tube. Corolla white (*F. Muell.*), the tube about 2 lines long, the lobes narrow, acute, longer than the tube. Anthers 2-celled. Capsule 2 to 3 lines long, oblong but scarcely acuminate. —*A. spinescens*, *F. Muell. Fragm. i.* 122, vi. 143.

W. Australia. *Drummond. n.* 86; Kalbarri river, *F. Muell.*; Thomas river and W. Mount Barren, *Maxwell*; Murchison river, *Oldfield*.

There is in the Muellerian herbarium a single small specimen from Murchison river, *Oldfield*, closely allied to *A. gracilis* and to *A. graustoides*, with the unarmed branches and linear leaves of the former, and the flowers of the latter, except that the corolla-lobes are contorted-inbricate in the bud, but that may possibly be an abnormal monstrosity.

5. ***A. anisantha***, *Endl. in Ann. Wien. Mus.* ii. 201. An erect rigid intricately-branched shrub, more or less glandular-pubescent, the smaller branchlets reduced to divaricate spines as in *A. graustoides*, but stouter. Leaves small, from linear-cuneate and about $\frac{1}{2}$ in. long, to almost obovate and about $\frac{1}{4}$ in., or often reduced to minute scales. Flowers on short pedicels, solitary or 2 or 3 together in the axils of the spines. Calyx glandular-hirsute, the tube about 1 line long, the teeth either short or as long as the tube. Corolla-tube broad, about 2 lines long; lobes narrow, acute, longer than the tube. Anthers 2-celled.—*Benth. in DC. Prod. x.* 192; *F. Muell. Fragm. vi.* 143.

S. Australia. Boston Island, *Wilhelmi*; Lake Gillies, *Burkitt*.

W. Australia, *Drummond*.

The above are all single specimens in Herb. *F. Muell.* I have not seen the typical specimen from W. Australia, *Roe*, but *Endlicher's* description agrees perfectly with *Drummond's* plant, except that I do not find the corolla-lobes more unequal than in several other species.

6. ***A. intricata***, *F. Muell. Fragm. i.* 211. A shrub of 10 to 12 ft., closely allied to *A. arborea*, with divaricate flexuose glabrous branches, the smaller ones occasionally spinescent. Leaves often clustered at the nodes, and similar to those of *A. arborea*, but smaller and fewer. Pedicels short, solitary or clustered, glandular-pubescent as well as the calyxes. Flowers entirely of *A. arborea*. Fruit not seen.

W. Australia. Murchison river, *Oldfield*. Probably a slightly spinescent variety of *A. arborea*; the specimens of both forms insufficient for their proper definition.

7. ***A. arborea***, *F. Muell. Fragm. i.* 212. A shrub or small tree, attaining 12 ft., with an erect trunk of 4 to 6 ft. (*Oldfield*), glabrous except the inflorescence, which is glandular-pubescent, the branches flexuose and intricate, but without spines in the specimens seen. Leaves usually clustered at the nodes or scattered on the short flowering branchlets, linear-oblong, obtuse, entire, narrowed into a petiole, rather thin, mostly nearly 1 in. long. Flowers whitish, on slender pedicels, in short cymes or almost solitary on the branchlets. Calyx glandular-hirsute, the tube under 1 line long, the teeth narrow, usually longer than the tube. Corolla-tube 2 to $2\frac{1}{2}$ lines long, the lobes narrow, acute, 2 or 3 times as long as the tube. Anthers 2-celled. Capsule narrow, 4 to 5 lines long, the valves bifid at the end.

W. Australia. Murchison river, Oldfield.

8. **A. angustifolia**, F. Muell. in *Trans. Phil. Soc. Vict.* i. 21, and in *Hook. Kew Journ.* viii. 202. A glandular-pubescent unarmed shrub. Leaves linear, acute or almost obtuse, entire, contracted at the base, mostly $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Flowers white, few, terminal or leaf-opposed, on rather slender pedicels. Calyx glandular-hirsute, the tube about 1 line long, the lobes narrow, usually longer than the tube. Corolla-tube $\frac{1}{4}$ in. long, yellowish inside; lobes narrow, acute, at least twice as long as the tube. Anthers 2-celled. Capsule ovoid, exceeding the calyx, but not seen perfect.

S. Australia. Stony glens near Mount Lofly and on the Torrens river, F. Mueller.

9. **A. fasciculata**, F. Muell. *Fragm.* i. 122. A shrub of about 3 ft., the branches and foliage viscid but scarcely pubescent, the inflorescence glandular-pubescent. Leaves oblong linear or oblanceolate, obtuse, entire, narrowed into a petiole, rather thick, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, the upper ones much reduced. Flowers shortly pedicellate, in terminal almost leafless panicles. Calyx glandular-pubescent, the tube about 1 line long, the teeth rather shorter than the tube and obtuse. Corolla-tube fully 2 lines long; lobes obtuse, shorter than the tube. Anthers 2-celled. Capsule 4 to 6 lines long, acuminate, the valves scarcely bifid, diverging at the end.

W. Australia. Phillips river, Maxwell. Some specimens closely resemble the larger-leaved specimens of *A. myosotidea*, but are readily distinguished by the 2-celled anthers.

SECT. II. CYPHANTHERA.—Anthers 1-celled, reniform. Plants glabrous, glandular-pubescent or stellate-tomentose. Capsule short, globular or ovoid, the valves bifid.—*Cyphanthera*, Miers; *Eadesia*, F. Muell.

10. **A. microphylla**, F. Muell. *Fragm.* i. 179; vi. 143. A small intricately branched shrub, viscid with a minute glandular pubescence, the older leaves and branches becoming glabrous, the smaller branchlets slender and rigid but not spinescent. Leaves sessile, ovate or oblong, obtuse, entire, rather thick, $\frac{1}{2}$ to 1 line long. Pedicels terminal or opposite the upper leaves, 1 to 2 lines long, glandular-pubescent. Calyx glandular-pubescent, not exceeding 1 line including the obtuse teeth or lobes. Corolla-tube $1\frac{1}{2}$ lines long or rather more, the upper portion broadly campanulate, the lobes broad, obtuse, shorter than the tube. Anthers 1-celled. Capsule nearly globular, as long as the calyx. Seeds few.—*Cyphanthera microphylla*, Miers, *Illust.* ii. App. 33. t. 85.

W. Australia, Drummond (5th Coll.?), n. 177; Salt river, Maxwell.

11. **A. myosotidea**, F. Muell. in *Trans. Phil. Soc. Vict.* i. 20, in *Hook. Kew Journ.* viii. 202, and *Fragm.* vi. 143. A low diffuse undershrub, the branches and foliage pubescent and viscid with short glandular hairs, without stellate tomentum. Leaves sessile, from oval-oblong to linear, from under $\frac{1}{2}$ in. long when broad to above $\frac{1}{2}$ in. when narrow, obtuse, entire, rather thick, the margins recurved. Pedicels rather short, solitary, terminal or opposite the upper leaves, usually reflexed after flowering. Calyx glandular-pubescent, the tube about 1 line long; teeth narrow, usually as long as the tube. Corolla white, varying in size, the tube from under 2 lines to nearly $2\frac{1}{2}$ lines,

very open at the top; lobes broad, obtuse, about as long as the tube. Anthers 1-celled. Capsule shorter than or scarcely exceeding the calyx, ovoid-globular; valves bilid. Seeds few.—*A. amblyantha*, F. Muell. Fragm. i. 179.

Victoria. Grampians and Wimmera, *Dallachy*.

S. Australia. Gravelly sand ridges on the Murray, *F. Mueller*; Tattiarra County, Woods.

12. **A. scabrella**, *Benth. in DC. Prod. x. 192*. A spreading shrub, with the foliage nearly of *A. albicans*, but the branches much more slender, the smaller ones almost filiform, and scabrous as well as the leaves with small stellate hairs, but not tomentose. Leaves ovate or oblong, obtuse, entire, very shortly petiolate, from $\frac{1}{4}$ in. long when broad to $\frac{1}{2}$ in. when narrow. Pedicels mostly filiform, solitary, terminal or opposite the upper leaves. Calyx and corolla-tube of *A. albicans*, but the acute corolla-lobes appear to be longer and more slender than in that species. Anthers 1-celled. Capsule not seen.—*Cyphanthera scabrella*, Miers, Illustr. ii. App. 32. t. 85.

N. S. Wales. Nepean river, *R. Cunningham*.

13. **A. albicans**, *A. Conn. in Field, N. S. Wales, 335, t. 2*. An erect much-branched shrub of 2 or 3 ft., the branches and foliage densely covered with a stellate tomentum, rather loose and almost floccose in the typical form. Leaves ovate or oblong, very obtuse, entire, the margins often recurved, sessile or very shortly petiolate, from $\frac{1}{4}$ in. long when broad to about $\frac{1}{2}$ in. when narrow. Flowers shortly petiolate, usually 2 or 3 together in the upper axils, forming sometimes narrow leafy panicles. Calyx-tube under 1 line long, glabrous or loosely stellate-tomentose in the typical form, the teeth narrow, shorter or longer than the tube. Corolla white, the tube about 2 lines long, streaked with purple inside; lobes very narrow, acute, longer than the tube. Anthers 1-celled. Capsule small, globular, the valves bilid. Seeds few.—*Benth. in DC. Prod. x. 192*; Sweet, Fl. Austral. t. 16; *Cyphanthera albicans*, Miers, Illustr. ii. App. 31. t. 84, and *C. ovalifolia*, Miers, l. c. 33. t. 85.

N. S. Wales. Pine Hills near Bathurst, *A. Cunningham*, also *Buckhouse*; near Cassilis, *C. Moore*.

Var. *tomentosa*, *Benth. l. c.* Tomentum close and white, covering the calyxes as well as the rest of the plant.—*Cyphanthera tomentosa*, Miers, Illustr. ii. App. 32. t. 85.—Peel's Range, *A. Cunningham*.

14. **A. tasmanica**, *Hook. f. Fl. Tasm. i. 289. t. 92*. An erect shrub, attaining 10 to 12 ft., the branches and foliage covered with a short stellate tomentum. Leaves oblong or lanceolate, obtuse, entire, the margins usually recurved, contracted into a short petiole, mostly $\frac{3}{4}$ to $1\frac{1}{2}$ in. or when luxuriant 2 in. long. Flowers of a yellowish white, on short petioles, 2 or 3 together in the axils of small floral leaves and crowded at the ends of the branchlets. Calyx tomentose, the tube about 1 line long; lobes or teeth acuminate, usually about as long as the tube. Corolla-tube 2 to $2\frac{1}{2}$ lines long, streaked with purple inside; lobes lanceolate, acute, at least as long as the tube. Anthers 1-celled. Capsule small, nearly globular; valves bilid. Seeds few.—*Cyphanthera tasmanica*, Miers, Illustr. ii. App. 30. t. 84.

Tasmania. Kelvedon, Great Swan Port, amongst gum-trees, *Backhouse*; not uncommon on the E. coast, *Guan*; Cygnet river, *C. Stuart*. Differs from *A. Eadesii* chiefly in the tomentum.

15. **A. Eadesii**, *F. Muell. Fragm.* ii. 139. An erect shrub of 3 or 4 ft., the branches and young foliage slightly hoary with a minute pubescence scarcely stellate and sometimes slightly glandular, the adult leaves and stems usually glabrous. Leaves oblong or lanceolate, obtuse, entire, contracted into a short petiole or the upper ones sessile, the larger ones 3 to 4 in. long, but those of the flowering branches under 2 in. Flowers nearly white, irregularly and loosely cymose in the upper axils, forming terminal oblong leafy panicles, the pedicels and calyxes slightly glandular-pubescent. Calyx-tube above 1 line long, the teeth rather obtuse, rarely as long as the tube and often very short. Corolla-tube $2\frac{1}{2}$ lines long; lobes oblong, acute, rather shorter than the tube. Anthers 1-celled. Capsule small, nearly globular. Seeds few.—*Cyphanthera frondosa* and *C. cuneata*, *Miers, Illust.* ii. App. 29 and 31. t. 84; *Eadesia anthocercidea*, *F. Muell. in Trans. Phil. Inst. Vict.* ii. 72.

N. S. Wales. Near Camden, *M'Arthur*.

Victoria. Ranges near Mount Zero, *Grampians, Willhelmi*; summit of Mount Arapiles and Wimmera, *Dallachy*.

S. Australia. Tattiarra country, *Woods*.

16. **A. racemosa**, *F. Muell. Fragm.* i. 211. A shrub of 4 to 6 ft., glabrous except the very young shoots, which are occasionally white with a minute stellate tomentum. Leaves sessile, the lower ones lanceolate, the upper ones linear, obtuse, thick, flat or with recurved margins, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Flowers 2 or 3 together in the axils, or the upper ones forming irregular racemes. Pedicels rather slender. Calyx-tube scarcely 1 line long; lobes linear, nearly as long as or rather longer than the tube. Corolla-tube nearly 2 lines long; lobes obtuse, about as long as or even longer than the tube. Anthers 1-celled. Capsule small, ovoid, the valves deeply bifid. Seeds few.

W. Australia. Murchison river, *Oldfield*. The specimens very imperfect.

17. **A. (?) Hopwoodii**, *F. Muell. Fragm.* ii. 138. A glabrous tree or shrub. Leaves narrow-linear, acutely acuminate, with the point often recurved, entire, rather thick, narrowed into a short petiole, 2 to 4 in. long. Flowers in short terminal cymes or leafy pyramidal panicles. Bracts minute. Calyx small, broadly campanulate, with obtuse teeth. Corolla-tube campanulate, 3 to $3\frac{1}{2}$ lines long; lobes broad, very obtuse, shorter than the tube. Anthers 1-celled. Fruit unknown.

N. S. Wales. Darling river, very rare, *Victorian Expedition*.

W. Australia, *Drummond* (with rather smaller flowers than in the N. S. Wales specimens).

18. **A. (?) Leichhardtii**, *F. Muell. Fragm.* vi. 142. A glabrous shrub (or tree?), with the foliage and inflorescence of *Duboisia myoporoides*. Leaves oblong-lanceolate, rather obtuse, entire, narrowed into a petiole, quite flat, 2 to 4 in. long. Panicles terminal, somewhat leafy at the base, broadly pyramidal or corymbose. Bracts very small. Pedicels short. Calyx small,



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broadly campanulate, with short broad teeth. Corolla-tube nearly 2 lines long, ovate-campanulate; lobes narrow, acuminate, rather longer than the tube. Anthers 1-celled. Fruit unknown.

Queensland, *Leichhardt*, the precise locality unknown. The specimens might be mistaken for those of *Daboisia myoparoides*, were it not for the narrow acute corolla-lobes; and, as in the case of *A. Hopwoodii*, until the fruit shall have been observed it is in some measure uncertain whether it should be referred to *Anthocercis* or to *Daboisia*.

SUBORDER II. ANTIRRHINIDÆ.—Corolla 5-lobed or 2-lipped, imbricate in the bud, the upper lip or 2 upper lobes outside. Inflorescence centripetal or, in genera not Australian, compound, the primary peduncles centripetal but branching into centrifugal cymes.

In the great majority of genera the difference in aestivation between the *Antirrhinidæ* and *Rhinanthidæ* is well marked and easily ascertained. It is only in some of the minute-flowered *Limosellæ*, and a very few non-Australian small genera of *Sibthorpiæ* that the aestivation is uncertain and perhaps variable. The dehiscence of the capsule in *Antirrhinidæ* is very variable, and in a very few non-Australian genera, the fruit is a berry.

TRIBE GRATIOLEÆ.—Corolla tubular at the base, neither spurred nor gibbous. Stamens shorter than the corolla, ascending, didynamous or reduced to two. Capsule opening in 2 or 4 valves or very rarely indehiscent.

SUBTRIBE I. EUGRATIOLEÆ.—Leaves, at least the lower ones, opposite. Stamens all inserted in the tube and, in the Australian genera, entirely included. Capsule, in the Australian genera, opening loculicidally in 2 entire or 2-fid valves, or 4-valved, or septicidal with 2-fid valves.

3. MIMULUS, Linn.

(*Uvedalia*, R. Br.)

Calyx tubular, with 5 prominent angles, ending in 5 small teeth. Corolla tubular at the base, the upper lip erect or spreading, 2-lobed; the lower lip spreading, 3-lobed, usually with 2 protuberances at its base in the throat; all the lobes broad and rounded. Stamens 4 in pairs; anthers all perfect, 2-celled, but the cells often confluent at the top. Style with 2 ovate nearly equal stigmatic laminae. Capsule scarcely furrowed, opening loculicidally in 2 valves which sometimes split along the dissepiment; leaving an entire or bifid central column bearing the placentas. Seeds small, numerous.—Erect or prostrate herbs. Leaves opposite. Flowers solitary on axillary pedicels, without bracteoles, the upper ones forming sometimes a terminal raceme.

The genus is widely dispersed over the temperate regions of N. and S. America, as well as along the range of the Andes, more sparingly in Eastern Asia, the mountains of tropical Asia and in S. Africa. Of the four Australian species, one is closely allied to, if not identical with, a common one in Asia and Africa, another extends to New Zealand, the remaining two are endemic.

Stems ascending or erect, not much branched except at the base. Plant glabrous.

Annual (?), very slender and weak, with small linear-lanceolate distant leaves

Perennial. Leaves oblong or lanceolate, obtuse 1. *M. Uvedaliæ*.
2. *M. gracilis*.

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Stems prostrate or creeping, much branched.

Plant glabrous. Leaves rather thick, ovate or oblong 3. *M. repens*.

Plant more or less pubescent. Leaves very small, narrow-oblong.

Corolla-tube long 4. *M. prostratus*.

1. *M. Uvedaliæ*, Benth. in DC. Prod. x. 369. Apparently annual and quite glabrous, the stems very slender and weak, slightly branched, under 1 ft. long. Radical leaves rosulate, ovate, but very soon disappearing; stem-leaves small and distant, linear-lanceolate, acute or scarcely obtuse, entire, stem-clasping, rarely exceeding $\frac{1}{2}$ in. Pedicels in the upper axils slender, 1 to 2 in. long or more. Calyx 2 to $2\frac{1}{2}$ lines long, the teeth very small. Corolla about twice as long as the calyx, pale blue with a yellow throat (*Soland. MSS.*). Capsule oblong, shorter than the calyx, the valves readily splitting. — *Uvedalia linearis*, R. Br. Prod. 440.

Queensland. Endeavour river, Banks and Solander, A. Cunningham; Broad Sound and Shoalwater Bay, R. Brown.

Var. *lutea*. Corolla yellow (F. Mueller), the dried specimens absolutely undistinguishable from the typical form. *M. debilis*, F. Muell. in Trans. Phil. Inst. Vict. iii. 62.

N. Australia. Swamps at the source of the Macarthur river, Providence Hill and Macadam Range, growing with *Uvedalia linearis*, F. Mueller.

2. *M. gracilis*, R. Br. Prod. 439. Quite glabrous. Stems from a perennial somewhat creeping rhizome, erect, usually about 6 in. and rarely in the Australian specimens nearly 1 ft. high, not much branched except at the base. Leaves linear-oblong to oblong lanceolate, obtuse, entire, in some specimens attaining 1 in., but in others all under $\frac{1}{2}$ in. long. Pedicels sometimes scarcely longer than the leaves, but often attaining 1 to 2 in. Calyx about $2\frac{1}{2}$ lines long, with short acute teeth. Corolla violet purple or blue, the tube shortly exceeding the calyx or rarely half as long again, the lobes very broad, those of the lower lip retuse, all minutely ciliate. Capsule enclosed in the calyx, oblong, the valves readily splitting. — Benth. in DC. Prod. x. 369; *M. pusillus*, Benth. l. c.

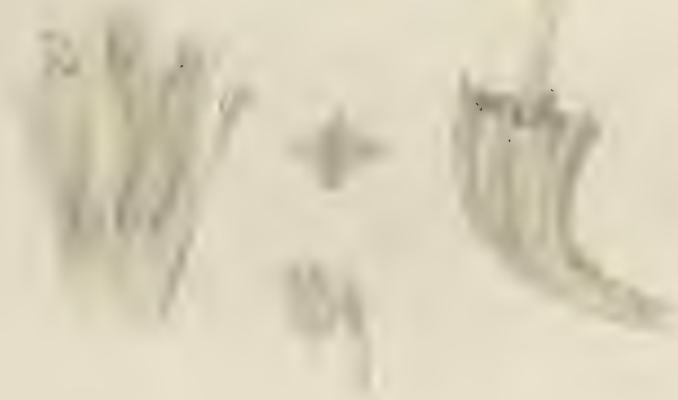
Queensland. Broad Sound, R. Brown; Dawson river, F. Mueller; Rockhampton, O'Shanesy; Curriwillighi, Dalton; Warwick, Beckler.

N. S. Wales. Hunter's River, R. Brown; Blue Mountains, A. Cunningham, Woolls, and others; New England, C. Stuart, C. Moore, and others; towards Bathurst, A. Cunningham; Murray and Darling rivers and Monument Creek, Victorian Expedition.

Victoria. Station Peak and Avoca river, F. Mueller; Wimmera, Dalbachy.

The species is also widely spread over hilly regions in Asia and Africa, but there represented chiefly by a luxuriant variety larger in all its parts, which I had originally published under the name of *M. strictus*, and from which the description of *M. gracilis* in the 'Prodromus' is chiefly taken. The common form in Australia is the smaller one which I had considered as a distinct species under the name of *M. pusillus*, but some of the luxuriant Queensland specimens come very near to the Asiatic ones.

3. *M. repens*, R. Br. Prod. 439. A small glabrous prostrate perennial, creeping and rooting at the joints. Leaves sessile or scarcely petiolate, sometimes stem-clasping, from broadly ovate to oblong, obtuse, rather thick, often all under 2 lines long and rarely exceeding 3 lines. Flowers few, the pedicel often shorter than the leaves at the time of flowering, but lengthening considerably afterwards. Calyx scarcely 2 lines long, truncate, with small distant teeth. Corolla blue often yellow in the centre, the tube not 3 lines



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long, dilated upwards, the lobes all broad and as long as the tube, the upper ones not much shorter than the lower. Capsule nearly globular, about 2 lines diameter, the valves readily splitting. —Benth. in DC. Prod. x. 373; Hook. f. Fl. Tasm. i. 290; Bot. Mag. t. 5423.

N. S. Wales. Manly Beach, *Woolfs*; Blue Mountains and Illawarra, *A. Cunningham*; Darling river, *Neilson*.

Victoria. Swamps on the Murray, about Melbourne, etc., *F. Mueller* and others; Portland, *Allitt*.

Tasmania. Port Dalrymple, *R. Brown*; common in saline situations, on muddy banks of rivers, etc., *J. D. Hooker*.

S. Australia. Near Kaiserstuhl, towards Mount Remarkable, *F. Mueller*.

W. Australia. Murchison river, *Oldfield*, *Drummond*, 6th coll., n. 129 (apparently this species, but the specimens not good).

The species is also in New Zealand. The habit and foliage is often that of smaller specimens of *Herpestis Monniera*, but the calyx and corolla are very different.

4. ***M. prostratus***, Benth. in DC. Prod. x. 373. A small diffuse or prostrate much-branched perennial, more slender than *M. repens*, and not so frequently rooting at the joints, the whole plant rarely exceeding 2 or 3 in., the branches and peduncles and often the foliage also pubescent and sometimes slightly glandular. Leaves sessile, narrow-oblong, obtuse, entire, 1 to 2 or rarely 3 lines long, resembling those rather of *M. gracilis* than of *M. repens*. Pedicels filiform, usually longer than the leaves, and sometimes $\frac{3}{4}$ in. long. Calyx scarcely 2 lines long, with short acute teeth. Corolla-tube at least twice as long as the calyx, and more slender than in the other Australian species. Capsule oblong, shorter than the calyx, the valves usually entire.

Queensland. Bokhara scrub, *Leichhardt* (with rather long leaves, attaining 3 lines, but the specimens imperfect).

N. S. Wales. Lachlan river, *A. Cunningham*; Murray and Darling rivers, *Dallachy*, *Victorian Expedition*; Mount Murchison, *Booncy*.

S. Australia. S. of Wills' Creek, *Howitt's Expedition*.

F. Muell. Fragm. vi. 103, from my character in the 'Prodrômus' (in which I had omitted the pubescence, having overlooked it in *Cunningham's* imperfect specimens), unites this with *M. repens*, the specimens were, however, referred in his collections to *M. gracilis*. It appears to me to be perfectly distinct from *M. repens* in its foliage and capsule, from *M. gracilis* in its dwarf prostrate habit, and from both in the pubescence, of which there is no trace in any other Australian species, as well as in the longer and more slender tube of the corolla.

4. **MAZUS**, Lour.

Calyx broadly campanulate, 5-lobed. Corolla with the upper lip erect, ovate, shortly bifid; the lower lip much larger, spreading, broadly 3-lobed, with 2 slight protuberances at its base in the throat. Stamens 4, all fertile; anther-cells contiguous, at length divaricate. Style with 2 ovate equal stigmatic laminae. Capsule globular or compressed, obtuse, opening loculicidally in 2 entire valves. —Low herbs. Lower leaves opposite, the upper ones alternate, or all nearly rosulate. Flowers in terminal one-sided racemes or solitary.

The genus comprises a small number of tropical and east Asiatic species, besides the Australian one, which only extends to New Zealand.

1. **M. pumilio**, *R. Br. Prod.* 439. A small perennial, with a creeping rhizome. Stems very short or scarcely any besides the peduncle. Leaves forming an erect tuft or spreading rosette, from obovate and not $\frac{1}{2}$ in. long to oblong and above 2 in. long, all obtuse, irregularly sinuate-toothed or rarely entire, contracted into a petiole, sprinkled with a few hairs on the upper surface, glabrous or nearly so underneath, rarely glabrous on both sides. Scapes or peduncles leafless, usually exceeding the leaves, bearing either a single flower or a loose raceme of very few flowers on long pedicels. Bracts very few and minute, scattered more frequently on the pedicels than on the peduncle, and often entirely wanting. Calyx about 2 lines long, the lobes narrow, shorter than the tube, enlarged and more deeply lobed after flowering. Corolla-tube scarcely exceeding the calyx; lobes of the lower lip longer than the tube. Capsule enclosed in the calyx.—*Benth.* in *DC. Prod.* x. 375; *Hook. f. Fl. Tasm.* i. 290; *Endl. Iconogr.* t. 102; *Hook. Ic. Pl.* t. 567 (the flowers too small).

N. S. Wales. Hastings and Clarence rivers, *Beckler*; Archer's Station, *Leichhardt*.

Victoria. Owens river, Plenty Ranges, Dandenong Mountains, Wilson's Promontory, *F. Mueller*; Fitzroy river, *Robertson*; Portland, *Allitt*.

Tasmania. Port Dalrymple, *R. Brown*; common in wet places, *J. D. Hooker*; King's Island, *R. Brown* (a dwarf form with leaves of $\frac{1}{2}$ in. and short 1-flowered scapes).

The species is also in New Zealand, and comes near to some of the smaller forms of the common Asiatic *M. rugosus*, but besides the difference in habit and foliage, the calyx is narrow and much less open.

5. ADENOSMA, *R. Br.*

(*Pterostigma*, *Benth.*)

Calyx divided to the base into 5 segments or sepals, the upper one larger. Corolla tubular at the base, the upper lip erect, entire or notched, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers of the lower pair 1-celled (by the abortion of the other cell), of the upper pair 2-celled, with the cells separate and rather distant, or rarely 1-celled. Style dilated at the end into 2 short stigmatic lobes, and more or less winged below the lobes. Capsule acuminate, opening septically in 2 bifid valves or in 4 valves, the placentas of the 2 carpels completely separating at maturity. Seeds numerous, small, striate and reticulate.—Glandular-pubescent or villous herbs, usually strong-scented and turning black in drying. Leaves opposite. Flowers solitary in the upper axils, the upper ones often forming terminal spikes or heads. Bracteoles 2, linear, close under the calyx.

The genus consists of a very few tropical Asiatic plants. Of the two Australian species, one has a wide range in the Archipelago and some parts of India, the other is endemic. It differs from the section *Adenosmoides* of *Stemodon*, chiefly in the abortion of one cell of the upper anthers.

Stems erect. Leaves shortly petiolate 1. *A. cœrulea*.
Stems decumbent. Leaves on long petioles 2. *A. Macleri*.

1. **A. cœrulea**, *R. Br. Prod.* 443. An erect, simple or branched, rather coarse annual, from under 1 ft. to nearly 2 ft. high, glandular-pubescent or villous all over, strongly scented. Leaves shortly petiolate ovate and scarcely exceeding 1 in. in the typical form, ovate-lanceolate and above 2 in. long in

some Asiatic specimens, the floral ones gradually smaller and passing into sessile bracts not exceeding the calyxes. Flowers blue, very shortly pedicellate, the lower ones axillary and distant, the upper ones forming a more or less compact terminal raceme. Bracteoles shorter than the calyx. Calyx very villous, oblique and slightly curved, 3 to 4 lines long, the upper segment lanceolate, the lower ones linear. Corolla 5 to 6 lines long, the lips nearly equal, shorter than the tube. Lower stamens nearly as long as the corolla, with 1-celled anthers; upper ones shorter, the anthers with 2 cells separated by a broad thick connectivum. Capsule acuminate, rather hard, somewhat incurved, about as long as the calyx.—*Pterostigma villosum*, Benth. Scroph. Ind., and in DC. Prod. x. 380.

Queensland. Endeavour Bay, *Banks and Schander*; Point Lockart, *R. Brown*.

Although I had originally considered this genus to be the true *Adenosma* of Brown, I was subsequently misled by some specimens sent to me by A. Cunningham, as having been identified with the Banksian plant, and which proved to be inseparable from *Stemodia*. The examination, however, which I have now made of Brown's and Banks's typical specimens, shows that they belong in fact to my *Pterostigma villosum*, and that Cunningham's plant is very different, both in station and in character. The name of *Adenosma* must, therefore, be now given to the whole of my genus *Pterostigma*.

2. **A. Muelleri**, Benth. Apparently annual though rather hard, diffuse or decumbent, branched, glandular-villous and viscid, strongly scented, even when dry. Leaves on rather long petioles, ovate or ovate-oblong, obtuse, crenulate, rugose, $\frac{1}{2}$ to 1 in. long, the floral ones passing into the small sessile uppermost ones. Flowers rather large, sessile or very shortly pedicellate. Calyx glandular-villous, above 3 lines long when in fruit, the segments lanceolate, the upper one nearly twice as broad as the others. Corolla dark-coloured, the tube about as long as the calyx, the lips probably as long, the upper one broad and entire, the lower one 3-lobed. Anthers of the longer stamens with only one cell, the other one abortive or rudimentary, those of the shorter stamens 2-celled. Capsule acuminate, as long as the calyx.—*Stemodia odoratissima*, F. Muell. Herb.

N. Australia. Macarthur River, *P. Mueller*.

6. STEMODIA, Linn.

Calyx divided to the base into 5 segments or sepals, all equal or the upper one scarcely larger. Corolla tubular at the base, the upper lip broad, entire or notched, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled with the cells quite separate, usually stipitate. Style dilated at the summit into 2 stigmatic lobes or rarely entire, not winged. Capsule globular, ovate or acuminate, opening septicidally in 2 usually 2-fid valves or in 4 valves, the placentas of the two carpels completely separating at maturity (at least in the Australian section). Seeds numerous, small, striate and usually reticulate.—Herbs, rarely undershrubs, more or less glandular-pubescent or villous and often strong-scented. Leaves opposite or in whorls of 3 or 4. Flowers solitary in the axils, the upper ones often forming terminal spikes. Bracteoles usually 2, linear, close under the calyx.

The genus is chiefly from tropical and southern extratropical America, represented by two

species in tropical Asia and Africa. Of the four Australian species, one is the common Asiatic one, the other three endemic. They all belong to the section to which I had given the name of *Adenosma*, in the belief that it included Brown's genus of that name; but, as that now proves to be my *Pterostigma*, the present section, differing from it only by the anthers having all 2 perfect cells, may take the name of *Adenosmoides*.

Leaves mostly lanceolate or oblong, sessile and stem-clasping or a few of the lowest rarely petiolate. Stems erect or ascending.

Flowers sessile or very shortly pedicellate.

Corolla (about 3 lines long) shortly exceeding the calyx 1. *S. lythrifolia*.

Corolla (about 6 to 7 lines long) twice as long as the calyx 2. *S. grossa*.

Flowers on pedicels longer than the calyx 3. *S. viscosa*.

Leaves mostly ovate on long petioles. Stems decumbent. (Corolla 3 to 4 lines long?) 4. *S. debilis*.

1. ***S. lythrifolia***, *P. Muell. in Herb. Hook.* A hard erect slightly-branched herb attaining 1 to 2 ft., very softly villous all over, almost woolly, and sometimes slightly viscid. Leaves ovate-lanceolate, oblong or lanceolate, serrate or almost entire, narrowed below the middle but usually dilated and stem-clasping at the base, soft and rugose, the larger ones 1 to 2 in. long, the lowest sometimes more distinctly petiolate, the floral ones small and ovate passing into entire bracts. Flowers small, sessile in the upper axils, the uppermost forming a compact spike with the ovate bracts almost imbricate in 4 rows and scarcely exceeding the calyxes. Calyx glandular-pubescent, about 2 lines long, the segments narrow-lanceolate, acute, rather unequal. Corolla shortly exceeding the calyx, the upper lip broad, truncate or slightly notched. Anthers all 2-celled. Capsule hard, acuminate, not exceeding the calyx.—*Stemodia carnea*, Benth. in DC. Prod. x. 381, as to A. Cunningham's plant but not R. Brown's synonym.

N. Australia. Common in the rocky islands of the N.W. coast, *A. Cunningham*, *Bynoe*; Upper Victoria river, *P. Mueller*; islands of the Gulf of Carpentaria, *R. Brown* (not inserted in Brown's *Prodromus*).

Var. ? *tenuior*. Less woolly, the leaves broader and more membranous, the floral ones all toothed and not imbricate. — York Sound, N.W. coast, *A. Cunningham*. Perhaps a distinct species, but the specimens too imperfect to determine.

2. ***S. grossa***, *Benth.* A stout erect hard perennial or undershrub of 1 to 2 ft., glandular-villous all over, and strongly scented when fresh. Leaves mostly in whorls of three, ovate oblong or lanceolate, acutely toothed, the lower ones contracted below the middle, dilated and stem-clasping at the base, the larger ones above 1 in. long, the floral ones gradually smaller and more ovate. Flowers large for the genus, sessile in the upper axils, forming a terminal interrupted leafy spike. Calyx glandular-villous, about 3 lines long, the segments lanceolate, nearly equal. Corolla dark-coloured, at least 6 or 7 lines long, the tube broad, hairy inside, the upper lip very broad, entire, as long as the tube, the lower lip of the same length, with ovate obtuse lobes. Anthers all 2-celled. Capsule acuminate, about 2 lines long.

N. Australia. Desert Island of the N.W. coast, *Bynoe*; Nichol Bay, *Walcott*.

3. ***S. viscosa***, *Roxb. Pl. Corom. ii. 33. t. 163.* A perennial with ascending or erect not much-branched stems from under 6 in. to above 1 ft. high, the whole plant pubescent or villous, viscid and scented. Leaves opposite or in whorls of three, the lower ones often ovate and contracted into a

petiole, the upper ones or nearly all lanceolate, acute, serrate, often dilated and stem-clasping at the base, the larger ones 1 to 2 in. long but often all under 1 in., the upper floral ones gradually smaller but usually distant. Flowers axillary, on pedicels always longer than the calyx and sometimes exceeding the leaves. Calyx usually about 2 lines long, the segments narrow, nearly equal or one larger. Corolla at least twice as long as the calyx, the upper lip very broad, entire or slightly notched, the lower with 3 ovate very obtuse lobes. Anthers all 2-celled. Capsule acuminate, as long as the calyx.—Benth. in DC. Prod. x. 381.

N. Australia. Victoria river, *F. Mueller*; Gulf of Carpentaria, *Landsborough*.

W. Australia. Murchison river, *Oldfield, Drummond, 6th Coll. n. 127.*

The species is common in East India, and I can find no difference in the above Australian specimens.

Var. ? *grandiflora*. A coarser plant, with the flowers $\frac{3}{4}$ in. long and very broad.—Murchison river, *Oldfield, Drummond, 6th Coll. n. 128.*

4. **S. debilis**, *Benth.* Apparently annual and diffuse or decumbent as in *Adenosma Muelleri*, but much more slender, loosely hairy and slightly glandular. Leaves on long slender petioles, ovate, toothed, membranous, glandular dotted, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the upper floral ones smaller, more sessile, narrower and approximate but not imbricate. Flowers small, sessile or very shortly pedicellate. Calyx-segments lanceolate, acuminate, the upper one often 3 lines long, the others usually much smaller. Corolla shortly exceeding the calyx, but those expanded in the specimen not perfect; in the bud the upper lip broad and entire as in the preceding species. Anthers all 2-celled. Capsule acuminate, as long as the calyx.

W. Australia. Victoria river, *F. Mueller*.

7. MORGANIA, R. Br.

Calyx divided to the base into 5 narrow segments, all equal or nearly so. Corolla tubular at the base, the upper lip broad, entire or shortly 2-lobed, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled, with the cells quite separate and somewhat stipitate. Style deflected at the summit, with 2 short spatulate stigmatic lobes, scarcely winged at the bend. Capsule ovoid oblong or shortly acuminate, opening septicidally in 2 2-fid or in 4 valves, leaving the placentas united in a single column in the centre. Seeds numerous, small, striate.—Herbs either glabrous or slightly pubescent. Leaves opposite or rarely in whorls of 3, narrow. Flowers solitary in the axils, sessile or pedicellate, with small linear bracts close under the calyx.

The genus is limited to Australia. The four forms here admitted as species are very closely allied to each other, and are all united by *F. Mueller*, *Fragm. vi. 104*, with the Australian specimens of *Stemodia viscosa* into one species, transferred to *Limnophila* under the name of *L. Morgania*, and there is no doubt but that the three genera *Stemodia*, *Morgania*, and *Limnophila* are so closely connected that they might almost equally well be considered as sections of one genus characterized chiefly by the stamens. Still the differences in the capsule between *Stemodia* (sect. *Adenosma*) *Morgania* and *Limnophila* prove, upon examination, to be rather more definite than I had thought when working up *Morgania* for the 'Prodromus' on insufficient materials. In *Stemodia* (*Adenosma*) the carpels separate completely each one carrying off its own placenta; in *Morgania* the dissepiment splits,

forming inflexed margins to the valves, but the two placentas remain consolidated in a single central column; in *Limnophila* the margins of the valves are still somewhat inflexed, but a considerable portion of the dissepiment remains entire, detached from the valves, and bearing the placentas on its face: the dehiscence in the first two is septicial, in the third partially septifragal. The American section *Dianoste* of *Stemodia* has, however, much more the dehiscence of *Morgania*; and if the latter intermediate genus is to be united with one of the two others, it is rather with *Stemodia* than with *Limnophila*. The three, however, as now constituted, are natural groups easily recognized.

Flowers sessile or the pedicels rarely as long as the calyx. Corolla-lips
as long as the tube, the upper one entire.

Plant glabrous or nearly so 1. *M. floribunda*.
Plant hoary-pubescent 2. *M. pubescens*.

Pedicels mostly longer than the calyx.

Flowers rather large, the lips shorter than the tube, the upper one
entire 3. *M. glabra*.

Flowers small, the lips as long as the tube, the upper one shortly 2-
lobed 4. *M. parviflora*.

1. ***M. floribunda***, Benth. in *Mitch. Trop. Austr.* 384. Stems from a perennial stock erect, usually taller less branched and more rigid than in *M. glabra*, glabrous or nearly so and often glaucous. Leaves linear or linear-lanceolate, entire or with few teeth, from about $\frac{1}{2}$ in. to above 1 in. long. Flowers (blue?) almost sessile or on pedicels usually very short or rarely as long as the calyx, often appearing clustered with small leaves in the axils owing to the partial development of axillary branchlets. Calyx rather larger than in *M. glabra* and corolla the same size, but much more deeply cleft, the tube scarcely exceeding the calyx and the lips as long as the tube, the upper one broad truncate and entire as in *M. glabra*. Capsule shortly acuminate.

Queensland. Rockhampton and Keppel Bay, *Thozet*; Crocodile Creek, *Bowman*; Balonne and Narran rivers, *Mitchell*.

N. S. Wales. Macquarrie river, *Mitchell*; Murray and Darling rivers, *Victorian Expedition*, *Dallachy*, and others; Mount Murchison, *Giles*.

Victoria. Winmerra, *Dallachy*.

S. Australia. *Behr*; Holdfast Bay, *F. Mueller*, towards Spencer's Gulf, *Warburton*; Torrens river, *Whittaker*; Wills' Creek, Cooper's Creek, etc., *Howitt's Expedition*.

W. Australia. Murchison river, *Oldfield*, *Drummond*, 6th Coll. n. 126.

2. ***M. pubescens***, *R. Br. Prod.* 441. Very nearly allied to *M. floribunda*, and, as far as I can ascertain in the few specimens seen, with the same nearly sessile flowers calyx and corolla, but the whole plant hoary with a short soft pubescence.—Benth. in DC. *Prod.* x. 385; Endl. *Leonogr.* t. 103.

N. Australia. Roper river, *F. Mueller*.

Queensland. Comet river, *Leichhardt*; Broad Sound, *R. Brown*.

3. ***M. glabra***, *R. Br. Prod.* 441. Stems from a perennial stock erect, usually branched, rather slender, $\frac{1}{2}$ to 1 ft. high, glabrous or with a minute almost granular pubescence on the upper parts and flowers. Leaves sessile, linear or linear-lanceolate, entire or with very few small teeth, $\frac{1}{2}$ to 1 in. long. Flowers in the upper axils, on slender pedicels, sometimes short at first but at length much longer than the calyx. Calyx not 2 lines long, deeply divided into narrow segments. Corolla above $\frac{1}{2}$ in. long, the tube twice as long as the calyx, the lips broad, the upper one truncate, the lower 3-lobed, both

much shorter than the tube. Capsule shortly acuminate.—Benth. in DC. Prod. x. 385.

N. Australia. Upper Roper river and Alligator Point, *F. Mueller*; Albert river, *Henne*; Gulf of Carpentaria, *Landsborough*.

Queensland. Broad Sound, *R. Brown*; estuary of the Barakia, *F. Mueller*; Fitzroy river, *Bowman*; Barcoo river, *Mitchell*; Carriwilligki, *Dutton*.

N. S. Wales. Plains of the Gwydir, *Mitchell*; between the Darling and Cooper's Creek, *Neilson*; Ballandool river, *Locker*.

4. **M. parviflora**, *Benth.* Stems from a perennial almost woody stock erect, paniculately branched, 6 in. to above 1 ft. high, glabrous or slightly pubescent. Leaves very few, small and distant, all linear, a few of the largest $\frac{1}{2}$ to 1 in. long, but mostly reduced to small scales. Flowers much smaller than in the other species, on short rigid pedicels. Calyx about $1\frac{1}{2}$ lines long, glandular-pubescent. Corolla scarcely above 3 lines long, the lips about as long as the tube, the upper one shortly 2-lobed, the lower one 3-lobed to about the middle; anthers of the longer stamens smaller than those of the shorter ones, but all 2-celled. Capsule $1\frac{1}{2}$ lines long, scarcely acuminate.

N. Australia. Arnhem's Land, *F. Mueller*.

8. LIMNOPHILA, R. Br.

Calyx divided to the base or below the middle into 5 narrow segments, all equal or nearly so. Corolla tubular at the base, the upper lip broad, entire, notched or shortly 2-lobed, the lower one spreading, 3-lobed. Stamens 4, in pairs; anthers 2-celled, with the cells quite separate and somewhat stipitate. Style deflected at the summit, with 2 short flat stigmatic lobes, scarcely winged at the bend. Capsule broadly ovoid or oblong, usually obtuse, opening in 4 valves, leaving the dissepiment entire at least at the base, bearing the placentas on its faces, thus forming as it were two wings to the undivided placental column. Seeds numerous, small, striate and transversely reticulate. —Herbs usually growing in marshes or shallow water, glabrous or slightly pubescent, usually scented and marked with pellucid dots. Leaves opposite or whorled, toothed or deeply cut, the submerged ones in some species divided into numerous capillary segments. Flowers solitary in the axils, the upper ones sometimes forming a terminal raceme. Bracteoles linear, close under the calyx.

A considerable genus, chiefly tropical, and limited to the Old World. The four Australian species are all widely spread in tropical Asia, and one at least extends into Africa.

Lower leaves (or all) deeply divided. Flowers pedicellate. Calyx-segments 1-nerved. 1. *L. gratioloides*.
Leaves all undivided.

Flowers pedicellate. Calyx-segments several-nerved, striate.
Glabrous 2. *L. punctata*.
Pubescent or villous 3. *L. hirsuta*.
Flowers sessile. Calyx segments united at the base, slightly striate 4. *L. serrata*.

1. **L. gratioloides**, *R. Br. Prod.* 442. Stems from a creeping base, ascending or erect, usually about 6 in. high, but sometimes very short decumbent and branched, or drawn up into simple stems of 1 to 2 ft., the whole plant glabrous. Leaves mostly opposite, but the lower ones usually divided to the base into narrow toothed or pinnatifid segments so as to appear

whorled, and when under water cut up into numerous capillary segments or lobes; the upper ones sometimes, or very rarely nearly all, undivided, sessile, linear or lanceolate and slightly toothed, all under 1 in. long and usually about $\frac{1}{2}$ in. Pedicels in the upper axils longer than the calyx and usually exceeding the leaves. Bracteoles small. Calyx usually under 2 lines long at the time of flowering, the segments lanceolate, acuminate, broad at the base especially after flowering, membranous and 1-nerved. Corolla blue, with the centre yellow inside, about 5 or 6 lines long, the tube exceeding the calyx, the lips broad and shorter than the tube, the upper one shortly 2-lobed. Anthers cohering in pairs. Capsule broad and obtuse.—Benth. in DC. Prod. x. 389, with the synonyms quoted (except the reference to Gaudichaud's plate in Frey. Voy. t. 57. f. 1, which is evidently *L. sessiliflora*); F. Muell. Fragm. vi. 104.

N. Australia. Gulf of Carpentaria, *F. Mueller*.

Queensland. Broad Sound, *R. Brown, Bowman*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*.

The species is widely dispersed over tropical Asia and Africa. The flowers are variously described by Australian collectors as yellow pink or red.

2. ***L. punctata***, *Blume*; *Benth. in DC. Prod. x. 388*. Stems ascending or erect, usually taller and stouter than in *L. gratioloides*, often above 1 ft. high, the whole plant glabrous. Leaves opposite or rarely in whorls of 3, sessile and stem-clasping, oblong-lanceolate, minutely serrate, 1 to $1\frac{1}{2}$ or even 2 in. long, the upper ones smaller, the larger ones sometimes rugose. Flowers violet-blue, 7 to 8 lines long, on pedicels scarcely shorter than the floral leaves, the upper ones sometimes forming a very loose leafy raceme. Calyx-segments lanceolate, subulate-acuminate, often above 3 lines long, striate with 5 to 7 prominent nerves. Corolla-lips shorter than the tube, the upper one very broad and retuse but scarcely lobed. Anthers cohering in pairs. Capsule oblong, shorter than the calyx.

Queensland. Wide Bay, *Bideill*; Rockingham Bay, *Dallachy*. Common in the Indian Archipelago, also in Ceylon.

3. ***L. hirsuta***, *Benth. in DC. Prod. x. 388*. Very nearly allied to *L. punctata*, with the same undivided leaves, striate calyx, and rather large blue-violet corolla; but it is usually a smaller plant, the leaves more frequently in whorls of 3, the pedicels shorter, and the stems, pedicels, and calyx always, and usually the leaves also, pubescent or hirsute.

N. Australia. Arnhem's Land, *F. Mueller*. The precise station uncertain, as his labels of this and *L. gratioloides* have been mixed both in the Muellerian and in the Hookerian herbaria. The species has an extensive range in tropical Asia.

4. ***L. serrata***, *Gardich. in Frey. Voy. 418. t. 57*. Decumbent or erect, not much branched and quite glabrous, the stems usually slender, $\frac{1}{2}$ to 1 ft. long. Leaves ovate oblong or lanceolate, obtuse, obtusely-serrulate, the lower ones contracted at the base, the upper ones with a broader base, all stem-clasping, under 1 in. long. Flowers closely sessile in the upper axils, mostly distant, but the upper ones sometimes crowded into a short terminal leafy spike. Bracteoles small, linear. Calyx thinner than in the two preceding species, not exceeding 2 lines, the segments subulate-acuminate.

slightly striate and connected at the base into a short tube. Corolla rather slender, nearly twice as long as the calyx, the lips not half as long as the tube, the upper one broad, slightly notched, the lower of 3 broad rounded lobes. Anthers slightly cohering in pairs. Capsule ovoid, the persistent dissepiment broad.—Benth. in DC. Prod. x. 387.

N. Australia. Victoria, Upper Raper, and Patersonia rivers, and swamps near Providence Hill, *P. Mueller*. The species is dispersed over the Indian Archipelago, and extends to the Pacific Islands, and if, as is probable, *L. conferta*, Benth. l. c., is but a variety of the same, it is also in Ceylon and several parts of E. India.

9. HERPESTIS, Gärtn. f.

Calyx divided to the base into 5 distinct sepals, the outer one much broader than the others. Corolla tubular at the base, the upper lip erect or spreading, notched or 2-lobed, the lower lip spreading, 3-lobed, or sometimes the 5 lobes nearly equal. Stamens 4, in pairs, the anthers all perfect, 2-celled, the cells contiguous. Style dilated at the summit, concave or slightly 2-lobed. Capsule opening loculicidally in 2 often but 1 valves or in 4 valves, leaving the placentas on a free central column or dissepiment. Seeds numerous, usually striate and transversely reticulate. Glabrous or rarely pubescent herbs. Leaves opposite, entire, toothed or in some non-Australian aquatic species the submerged ones cut into numerous capillary segments. Flowers axillary, or, in species not Australian, in a terminal raceme. Bracteoles under the calyx only in a very few species.

A considerable tropical and subtropical genus, chiefly American, with a few species natives of the Old World. Of the two Australian species, one is common over nearly the whole area of the genus, the other extends over tropical Asia and Africa.

Erect. Leaves narrow. Flowers numerous, on short pedicels 1. *H. floribunda*.
Procumbent or creeping. Leaves small, obovate or oblong, rather thick. 2. *H. Monnieria*.
Flowers few, on long pedicels

1. ***H. floribunda***, *R. Br. Prod.* 142. Apparently annual, erect and branching, rarely above 1 ft. high, quite glabrous. Leaves lanceolate or linear-lanceolate, rather obtuse, entire, narrowed to the base, 1-nerved, rarely above 1 in. long. Pedicels slender but usually shorter than the petiole, often 3 together in each axil owing to the partial development of an axillary branchlet. Bracteoles very small, a little below the calyx. Calyx scarcely above $1\frac{1}{2}$ lines long at the time of flowering, 2 to 3 lines when in fruit, the segments thin, at first herbaceous, at length membranous and reticulate, the outer one broadly ovate, the 2 next narrow-ovate, the 2 innermost almost linear. Corolla scarcely exceeding the calyx. Capsule ovoid-globular, shorter than the calyx, opening in 4 valves.—Benth. in DC. Prod. x. 400.

N. Australia. Victoria river, *E. Moëther*; South Goulburn Island, *A. Cunningham*.
Queensland. Shoalwater Bay, *R. Brown*; Burdekin river, *Bowman*.
The species extends over tropical Asia and Africa.

2. ***H. Monnieria***, *H. B. and K.*; *Benth. in DC. Prod.* x. 400. A low creeping or procumbent glabrous leafy annual (or perennial?). Leaves obovate or oblong, rarely above $\frac{1}{2}$ in. long, rather thick, entire or crenate, without prominent veins or obscurely 1- or 3-nerved. Flowers few, pale blue or almost white, on pedicels usually rather longer than the leaves, with 2 small

bracteoles under the calyx. Calyx about 2 lines long or 3 lines when in fruit, the outer sepal oval, the others ovate-lanceolate or lanceolate. Corolla-tube scarcely so long as the calyx, the 5 lobes spreading, broad, as long as the tube, the 2 upper ones rather smaller and less deeply separated than the others. Capsule ovoid, shorter than the calyx, opening loculicidally in 2 valves, which at length separate from the dissepiment and sometimes split into 2.—Bot. Mag. t. 2557.

Queensland. Morston Island, *M^cGillivray*; Burnett river, *P. Moeller*; Nerkoel Creek, *Bowman*.

N. S. Wales. Paramatta, *Woolfs*.

The species is one of the commonest marsh plants in the tropical and subtropical regions of both the New and the Old World, and has been described under a great variety of names, as detailed in the above-quoted 'Prodromus.'

10. GRATIOLOA, Linn.

Calyx divided to the base into 5 nearly equal segments or sepals. Corolla tubular at the base, the upper lip broad and entire or shortly 2-lobed, the lower 3-lobed. Stamens 2 perfect, with the anthers connivent, the cells parallel and distinct but contiguous; the lower stamens reduced to slender staminodia or entirely wanting. Style dilated and deflected at the summit, entire or with 2 flat lobes. Capsule 4-valved, leaving a single columnar placenta bordered by a portion of the dissepiment. Seeds small, striate and transversely reticulate.—Erect or procumbent herbs, glabrous or glandular-pubescent. Leaves opposite, undivided. Flowers axillary, sessile or pedicellate, with a pair of bracteoles close under the calyx.

The species are not numerous, dispersed over the temperate and subtropical regions of both hemispheres. Of the three Australian species, one extends to New Zealand and extratropical South America, another to New Zealand only; the third appears to be endemic, but is closely allied to a common N. American one.

Flowers pedunculate. Stems erect. Leaves lanceolate. Stamino-	
none	1. <i>G. pedunculata</i> .
Flowers sessile. Stems erect. Leaves ovate or lanceolate. Stamino-	
dia filiform (often exceedingly slender)	2. <i>G. peruviana</i> .
Stems procumbent or creeping. Flowers shortly pedicellate. Leaves	
oblong or obovate. Stamino-dia filiform	3. <i>G. nana</i> .

1. ***G. pedunculata*, R. Br. Prod. 435.** Stems from a shortly decumbent or sometimes creeping base, erect or ascending, scarcely branched, $\frac{1}{2}$ to 1 ft. high, the whole plant minutely viscid-pubescent or rarely glabrous. Leaves lanceolate or oblong, bordered by a few teeth or nearly entire, the lower ones often contracted at the base but mostly stem-clasping, the larger ones sometimes above 1 in. long, but generally smaller. Pedicels shorter or sometimes longer than the leaves, rarely shorter than the calyx. Bracteoles linear, sometimes as long as the calyx. Calyx-segments linear-lanceolate, acute, rather unequal, 2 to $2\frac{1}{2}$ lines long. Corolla white, yellowish inside, at least twice as long as the calyx, the lips short and broad, the upper one very shortly 2-lobed. Anthers of the perfect stamens cohering, the cells parallel and transverse, the lower stamens entirely wanting. Capsule ovoid-globular, rather obtuse, often slightly exceeding the calyx.—Benth. in DC. Prod. x. 403.

Queensland. Burnett river, *F. Mueller*; Brisbane river, Moreton Bay, *A. Cunningham*; Rockhampton, *O'Shanesy*.

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart*; Richmond river, *C. Moore*; Darling Downs, *Lam.*

Victoria. Avoca and Murray rivers, Tambo, Forest Creek, *F. Mueller*.

W. Australia. *Draumond*, n. 52, and *4th Cat.* n. 158 (a glabrous form, with the pedicels usually shorter and the corolla smaller).

G. virginiana, from North America, is scarcely to be distinguished from this species by a more branching habit, the leaves more narrowed at the base, and the capsule not exceeding the calyx.

2. ***G. peruviana*, Lam.; Benth. in DC. Prod. x. 403.** Stems from a procumbent or creeping base, often rooting at the lower nodes, ascending or erect, 6 in. to 1 ft. high, the whole plant quite glabrous or viscid-pubescent. Leaves sessile and stem-clasping, from ovate to lanceolate, obtuse or acute, serrate or almost entire, usually 3-nerved especially when broad, $\frac{1}{2}$ to 1 in. long. Flowers sessile or nearly so in the upper axils, larger than in *G. pedunculata*. Calyx 2 to 3 lines long or even longer when in fruit, the segments linear-lanceolate, acuminate. Corolla 6 to 7 lines long, the lips broad, much shorter than the tube, the upper one notched. Anthers connivent, almost cohering, with transverse parallel cells. Staminodia filiform, with minute globular heads, sometimes short and so slender as to be very difficult to find, sometimes more elongated. Capsule ovoid-globular, rather obtuse, membranous.—*G. pubescens*, R. Br. Prod. 435; Benth. in DC. Prod. x. 404; Bartl. in Pl. Preiss. i. 342 (the narrow-leaved pubescent form); *G. latifolia*, R. Br. l.c.; Benth. l.c. 403; Hook. f. Fl. Tasm. i. 291 (the broad-leaved glabrous form); *G. glabra*, Walp. Rep. iii. 287 (given by mistake as a name of Brown's).

Queensland. Moreton Bay, *Fitzalan* (with rather broad glabrous leaves).

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*, and others; Hastings and Clarence rivers, *Beckler*; Illawarra, *A. Cunninghamham* (all glabrous or nearly so, with broad or rather narrow leaves); Macleay river, *Beckler* (with broad, very pubescent leaves).

Victoria. About Melbourne, *Adamson*, *F. Mueller*; near Portland, *Robertson*, *Allitt*; Victoria Range and Station Peak, *F. Mueller* (all glabrous, with broad or sometimes narrow leaves); Snowy River, Dandenong Ranges, marshes on the Murray, *F. Mueller* (with narrow, viscid-pubescent leaves).

Tasmania. Port Dalrymple, *R. Brown*; common everywhere in wet gravelly places, etc., *J. D. Hooker* (usually with broad leaves, and glabrous or nearly so); Jacke's Plain, and rocks in the Meander near Chesham, *Archer* (pubescent, with narrow leaves).

S. Australia. Torrens river, Gulf of St. Vincent, *F. Mueller*; Kangaroo Island, *Waterhouse* (mostly with broad leaves, and nearly glabrous).

W. Australia. King George's Sound, *R. Brown*, *Preiss*, n. 2326 and 2331; Karri Dale, *Walcott*; granite rocks, Mount Melville, *F. Mueller* (all viscid-pubescent, with narrow leaves).

Var. *parvula*. Plant of 2 or 3 in., with small narrow leaves, glabrous or viscid-pubescent.—*G. parvula*, *F. Muell.* in *Linnaea*, xxv. 431.—Port Jackson and Port Dalrymple, *R. Brown*; Victoria, *F. Mueller*.

The species is also in New Zealand and in extratropical S. America, where it is usually narrow-leaved and nearly glabrous, as represented by *J. A. Schmidt* in Mart. Fl. Bras. Scroph. t. 19, but occasionally very viscid-pubescent, and more rarely broad-leaved.

3. ***G. nana*, Benth. in DC. Prod. x. 404.** A dwarf procumbent or creeping much-branched plant, glabrous or minutely viscid-pubescent, not rising above a few inches from the ground, with something of the habit of

Herpestis Monnieria. Leaves oblong or obovate, narrowed at the base, very obtuse, rather thick, entire or obscurely toothed, 3 to 4 lines long. Flowers few, rather small, on short pedicels. Calyx glandular-pubescent, the segments rather obtuse, about 2 lines long. Corolla about 4 lines long. Anthers connivent, with transverse parallel cells; staminodia filiform, with minute heads, rather long. Capsule broadly ovoid.—Hook. f. Fl. Tasm. i. 291.

Victoria. Highest part of the Australian Alps, *F. Mueller* (*Herb. F. Muell.*).

Tasmania. Sandy and marshy banks of rivers, etc., in alpine situations, Marlborough, Hampshire Hills, and Arthur's Lakes, *Milligan, Gunn*; South Port, *C. Stuart*; Recherche Bay, *Oldfield*.

The species is also in New Zealand.

11. *DOPATRIUM*, Hamilt.

Calyx campanulate, 5-lobed. Corolla tubular at the base, with the lips spreading, the upper one 2-lobed, the lower larger and 3-lobed. Stamens, 2 upper ones perfect, included in the tube; anther-cells distinct and parallel, 2 lower reduced to minute filiform staminodia. Style with 2 flat stigmatic lobes. Capsule opening loculicidally in 2 entire or rarely bifid valves, bearing in their centre the separate placentas.—Slender glabrous herbs. Leaves opposite, chiefly at the base of the stem, the others usually minute and few. Pedicels filiform. Bractcoles none.

A genus with very few species, inhabitants of marshy or rich moist places in tropical Asia and Africa. The only Australian species is a common one in India.

The ovary and capsule of this genus, not quite correctly described in the 'Prodromus,' and still more inaccurately figured in Wight's plate of *D. lobelioides* (l. t. 859), differ from those of all other *Gratiolæ* in being scarcely perfectly 2-celled. The broad flat placentas are at right angles to the dissepiment, and although their inner faces are contiguous and bear no ovules or seeds, yet they do not cohere, the ovules and seeds being very numerous on their backs or outer faces, turned towards the walls of the cavity.

1. *D. junceum*, Hamilt.; *Benth. in DC. Prod.* x. 407. A glabrous erect annual, branching chiefly at the base, sometimes scarcely above 2 or 3 in. high, but when luxuriant its slender stems attain 1 ft. Lower and radical leaves oblong, obtuse, entire, contracted at the base and often above $\frac{1}{2}$ in. long, the others small, sessile, ovate, the upper ones few and distant and scarcely 1 line long. Flowers in the upper axils usually short but sometimes nearly $\frac{1}{2}$ in. long. Calyx scarcely $\frac{3}{4}$ line long, divided to about the middle into narrow obtuse lobes. Corolla-tube about $1\frac{1}{2}$ lines long, the throat very open, the upper lip 2-lobed, the lower very broadly 3-lobed, as long as the tube. Capsule globular, scarcely 1 line diameter.—*Gratiola juncea*, Roxb. Pl. Corom. ii. t. 129.

Queensland. Rockhampton, *O'Shanesey*. Common in E. India.

SUBTRIBE II. *LINDERNIEÆ*.—Stem-leaves opposite. Stamens, 2 upper ones inserted in the tube and usually included in it and perfect, the anthers approximate or cohering, the cells contiguous, often divaricate and sometimes confluent into one; 2 lower ones inserted in (or adnate to) the throat, either reduced to club-shaped linear or 2-fid staminodia, or when perfect with long arched filaments (short in the European *Lindernia*), with an angle or lobe near the base, the anthers cohering under the upper lip of the corolla, the

cells usually divaricate and often confluent. Capsule opening in 2 membranous entire valves, parallel to the broad thin dissepiment.

Like the majority of *Engurtioleæ*, the species are chiefly abundant in marshes or rich moist soils, and are more or less glandular-dotted. The principal genera are closely allied, and often distinguished chiefly by characters derived from the stamens, which are difficult to ascertain in dried specimens owing to the delicacy of the anthers, but still to be readily seen in living plants. F. Mueller proposes the reuniting several of them under the name of *Lindneria* or of *Vandellia*, but that would entail the regarding the whole subtribe as a genus, of which the present genera would be sections. This would appear to me to be more a nominal than a real change, involving all the inconvenience of a great addition to the synonymy without any corresponding advantage.

12. ARTANEMA, Don.

Calyx deeply divided into 5 herbaceous acuminate segments, dilated and much imbricate at the base. Corolla with a long broad tube, the upper lip broad and notched, the lower 3-lobed. Perfect stamens 4, the anthers cohering in pairs with divaricate cells, the upper stamens included in the tube; filaments of the lower ones adnate almost to the throat, long and arched, with a broad appendage near the base. Style with 2 flat stigmatic lobes. Capsule globular, opening in 2 thin valves parallel to the broad thin dissepiment. —Erect herbs. Leaves opposite. Flowers large, pedicellate in the axils of small bract-like floral leaves, without bracteoles.

The genus consists of only three closely allied species, one of them Australian, the other two from tropical Asia. It only differs from *Vandellia* in the larger flowers, broader calyx segments, and in the shape of the staminal appendage.

1. *A. fimbriatum*, Don in *Sweet Brit. Fl. Gard. ser. 2. t. 234*. An erect rather coarse annual (or sometimes perennial?) of 1 to 2 ft., the angles of the stems and upper surface of the leaves scabrous, otherwise glabrous. Lower leaves petiolate and ovate-lanceolate, upper ones more sessile and lanceolate, sometimes very narrow, the larger ones 2 to 4 in. long, all more or less serrate or rarely entire. Flowers violet, in distant pairs, forming very loose terminal racemes, the floral leaves reduced to small bracts. Pedicels $\frac{1}{2}$ to 1 in. long. Calyx-segments 3 to 4 lines long, the points usually recurved. Corolla above 1 in. long; lobes broad and rounded, minutely and irregularly crenulate or jagged. Appendage of the lower filaments broad, rounded, and scale-like. Capsule 3 to 4 lines diameter. —Benth. in DC. Prod. x. 408; *Torenia fimbriata*, Grah. in Edinb. New Phil. Journ. xi. 379; *T. scabra*, Grah. in Bot. Mag. t. 3104.

Queensland. Brisbane river, Moreton Bay, *Fraser*, F. Mueller, and others; Wide Bay, *Bidwill* (with narrow leaves); Rockingham Bay, *Dallachy*.

N. S. Wales. Hastings and Clarence rivers, *Beckler*; Richmond river, *Henderson*.

13. VANDELLIA, Linn.

Calyx either divided to the base into 5 narrow segments, or the segments more or less cohering into a short 5-toothed calyx (not folded and prominently angled, as in *Torenia*). Corolla tubular at the base, the upper lip erect, shortly 2-lobed, the lower lip larger, spreading, 3-lobed. Perfect stamens 4, the anthers cohering in pairs, with divaricate cells, the upper stamens

included in the tube; filaments of the lower ones adnate to the throat, long and arched, with an angle tooth or linear lobe near the base. Style with 2 flat stigmatic lobes. Capsule globular oblong or linear, opening in 2 entire valves parallel to the thin dissepiment.—Slender herbs, erect or diffuse and much-branched, glabrous or pubescent. Leaves opposite, undivided. Flowers opposite, or alternate by the abortion of one of each pair, axillary or in terminal racemes, the racemes sometimes contracted into umbels, without bracteoles.

The genus comprises a considerable number of species, mostly common weeds in the tropical and subtropical regions of the Old World, two of them being also found in S. America. Of the five Australian species, one is the commonest over the whole range of the genus; the others appear to be all endemic.

Calyx-segments united in a 5-toothed calyx, at least at the time of flowering. Stems diffusc. Leaves ovate 1. *V. crustacea*.

Calyx-segments separate from the first.

Leaves ovate, chiefly near the base of the stem.

Plant pubescent or hirsute 2. *V. pubescens*.

Plant glabrous.

Corolla-tube rather longer than the calyx 3. *V. alsinoides*.

Corolla-tube fully twice as long as the calyx 4. *V. scapigera*.

Leaves linear-subulate, few and mostly small 5. *V. subulata*.

1. ***V. crustacea*, Benth. Scroph. Ind. and in DC. Prod. x. 413.** A diffuse much-branched annual, glabrous or with a very few small scattered hairs, usually not exceeding 6 in. but attaining nearly 1 ft. when very luxuriant. Leaves shortly petiolate, ovate, broadly crenate or almost entire, sometimes almost cordate at the base, from under $\frac{1}{2}$ in. to about $\frac{3}{4}$ in. long. Pedicels usually $\frac{1}{2}$ to nearly 1 in. long, axillary or forming loose leafy racemes. Calyx about 2 lines long, membranous and 5-toothed, with 5 scarcely prominent nerves at the time of flowering, often splitting into 5 segments when the flowering is over. Corolla scarcely twice as long as the calyx. Capsule ovoid or almost oblong, shorter than or as long as the calyx.—Wight, l. c. t. 863; *Capraria crustacea*, Linn., and the numerous synonyms quoted in DC. Prod. as above; *Torenia flaccida* and *T. scabra*, R. Br. Prod. 440; *V. Brownii*, Benth. in DC. Prod. x. 413.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Endeavour river, *Banks and Solander*; Wide Bay, *Bidwill*; Port Denison, *Fitzalan*; Rockingham Bay, *Daltry*; Burdckin river and Broad Sound, *Bowman*; Rockhampton, *O'Shanesy*.

The species is very common in tropical Asia, extending into tropical Africa and America.

2. ***V. pubescens*, Benth. in DC. Prod. x. 415.** Stems branching at the base, decumbent or erect, rarely exceeding 6 in., pubescent or hirsute as well as the foliage. Leaves chiefly crowded at the base of the stems, ovate, obtuse, entire, contracted into a short petiole, often 1 in. long, with 1 or 2 pairs of small sessile leaves higher up, the floral ones very small. Pedicels few, in pairs, $\frac{1}{2}$ to 1 in. long, pubescent, reflexed after flowering. Calyx-segments very narrow, about $1\frac{1}{2}$ lines long. Corolla-tube at least 2 lines long. Capsule broadly ovoid, obtuse.

N. Australia. Port Essington, *Armstrong*.

3. **V. alsinoides**, *Benth. in DC. Prodr.* x. 415. A slender branching erect or diffuse annual, usually glabrous and not exceeding 6 in. Stem-leaves chiefly in the lower part of the plant, very shortly petiolate, broadly ovate or nearly orbicular, angular-toothed, thin and membranous, the larger ones 6 to 8 lines diameter, the floral ones very small or reduced to small bracts. Flowers small, on slender pedicels of $\frac{1}{2}$ to 1 in. reflexed after flowering, and usually one only to each pair of floral leaves. Calyx about $1\frac{1}{2}$ lines long, divided to the base into linear-subulate segments. Corolla-tube rather longer than the calyx, the upper lip short, the lower not so long as the tube. Appendage of the lower filaments linear, glandular. Capsule ovoid-oblong, rather longer than the calyx.—*Lindernia alsinoides*, R. Br. Prod. 441; *Tillmannia alsinoides*, Spreng. Syst. ii. 800; *Ilyogeton alsinoides*, Endl. in Walp. Rep. iii. 297.

Queensland. Facing Island, *R. Brown*; Wide Bay, *Bidwell*; Lizard Island, *McIlwray*; Moreton Bay, *C. Stuart*; Rockhampton, *O'Shanesy*.

4. **V. scapigera**, *Benth. in DC. Prodr.* x. 415. Stems branching at the base, ascending or erect, very slender, 6 in. high or more, the whole plant glabrous. Leaves chiefly collected at the base of the stems, ovate, entire, under $\frac{1}{2}$ in. long, the lowest broader and contracted into a short petiole, and 1 or 2 pairs higher up quite sessile, the floral ones very small and distant. Pedicels slender, 1 to 2 lines long, usually 1 only to each pair of floral leaves. Calyx divided to the base into linear segments scarcely 1 line long when in flower, rather longer afterwards. Corolla-tube about 2 lines long. Capsule ovoid-oblong, as long as the calyx.—*Lindernia scapigera*, R. Br. Prod. 441; *Tillmannia scapigera*, Spreng. Syst. ii. 800; *Ilyogeton scapigerum*, Endl. in Walp. Rep. iii. 297.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; near Macadam Range, *F. Mueller*. Very near *V. alsinoides*, but more slender, the calyx smaller and the corolla larger.

5. **V. subulata**, *Benth. in DC. Prodr.* x. 415. Stems numerous, slender, erect, glabrous, usually branched, often attaining 1 ft. Leaves linear-subulate, entire, the lower ones often $\frac{1}{2}$ in. long, the upper ones few and small, the floral ones setaceous. Pedicels filiform, often above 1 in. long, usually one only to each pair of floral leaves, but the uppermost often collected in a cluster or almost an umbel, with many minute floral leaves at their base. Calyx divided into linear-subulate segments, scarcely above 1 line long. Corolla fully 5 lines long. Capsule ovoid-oblong.—*Lindernia subulata*, R. Br. Prod. 441; *Tillmannia subulata*, Spreng. Syst. ii. 801; *Ilyogeton subulatum*, Endl. in Walp. Rep. iii. 297.

N. Australia. Elsey's River, *F. Mueller* (specimens past flower and somewhat doubtful); Port Essington, *Armstrong*.

Queensland. Endeavour river, *Banks and Solander*, *A. Cunningham*.

14. ILYSANTHES, Rafin.

Calyx divided to the base into 5 narrow segments. Corolla tubular at the base, the upper lip erect, shortly 2-lobed, the lower larger, spreading, 3-lobed. Perfect stamens 2, included in the tube, the anthers cohering, with divaricate

cells, the lower pair reduced to staminodia adnate to the throat, thence usually projecting and 2-lobed, one lobe ascending, acute, filiform or reduced to a short tooth, the other obtuse and glandular or reduced to an angle. Style with 2 flat stigmatic lobes. Capsule globular ovoid or shortly oblong, opening in 2 entire valves parallel to the thin dissepiment.—Glabrous slender annuals. Leaves opposite. Flowers on slender pedicels, axillary or in terminal loose racemes, without bracteoles.

There are several species dispersed over the warmer regions of Asia, Africa, and America, extending into more temperate North America and South Africa. The only Australian species appears to be endemic. The genus differs from *Fandellia* and *Lialberia* in the abortion of the lower stamens, from *Bonnaya* chiefly in the short capsule.

1. **I. lobelioides**, *Benth.* A glabrous erect very slender annual, attaining about 6 in. and scarcely branched. Leaves few, near the base of the stem, ovate obovate or oblong, entire, narrowed into a short petiole and only 3 or 4 lines long; and 1 or 2 pairs of minute distant narrow sessile leaves higher up the stem, the floral ones reduced to minute bracts. Flowers in a short loose terminal raceme, on slender pedicels of $\frac{1}{2}$ to 1 in., opposite or one only to each pair of bracts. Calyx-segments linear-lanceolate, $1\frac{1}{2}$ lines long. Corolla-tube above 3 lines long, the lower lip much shorter than the tube, the upper one still shorter. Staminodia very shortly ascending, acute, the glandular lobe reduced to a prominent angle near its base. Capsule broadly ovate, obtuse, about as long as the calyx. — *Fandellia lobelioides*, F. Muell. in Trans. Phil. Inst. Vict. iii. 61.

N. Australia. Victoria Range, F. Mueller. In the 'Fragmenta,' vi. 102, F. Mueller refers this to *Fandellia scapigera*, which, however, besides the difference in foliage, has always 4 perfect stamens.

15. BONNAYA, Link and Otto.

Calyx divided to the base or nearly so into 5 narrow segments. Corolla tubular at the base, the upper lip erect, shortly 2-lobed, the lower larger, spreading, 3-lobed. Perfect stamens 2, included in the tube, the anthers cohering, with divaricate cells, the lower pair reduced to staminodia adnate to the throat, the ends either scarcely prominent or linear, entire obtuse and glandular. Style with 2 small flat stigmatic lobes. Capsule linear, longer than the calyx, opening in 2 entire valves parallel to the thin dissepiment. — Annuals usually glabrous. Leaves opposite. Flowers axillary or in terminal racemes, without bracteoles.

A small genus, spread over tropical and subtropical Asia. Of the two Australian species, one is the one most common in Asia, the other appears to be endemic.

Stems diffuse, leafy. Staminodia free at the end, erect linear and obtuse.

Stems erect, the leaves few at the base of the stem. Staminodia wholly adnate

1. *B. veronicæfolia*.

2. *B. clausa*.

1. **B. veronicæfolia**, *Spreng.; Benth. in DC. Prod.* x. 121. A glabrous annual, much-branched, diffuse and rooting at the lower nodes, the flowering branches often ascending to 6 in. or more. Leaves sessile or narrowed into a short stem-clasping petiole, oblong-lanceolate or almost linear, the lower ones 1 to $1\frac{1}{2}$ in. long, entire or serrate, and often rather thick.

Flowers in terminal racemes, on spreading stiff pedicels of 3 to 6 lines, which are usually angular and thickened upwards, the subtending floral leaves reduced to minute bracts. Calyx narrow, 1 to $1\frac{1}{4}$ lines long, the segments sometimes united at the base. Corolla about twice as long as the calyx. Capsule linear, nearly $\frac{1}{2}$ in. long.—*B. verbenafolia*, Benth. in DC. Prod. x. 421, with the numerous synonyms given under both names; *Gratiola veronicaefolia*, Roxb. Pl. Corom. t. 154; *Lindernia veronicifolia*, F. Muell. Fragm. vi. 101.

Queensland, *Bowman*; Rockhampton, *O'Shaney*. Common in tropical Asia, extending northwards to Loochoo.

2. **B. clausa**, F. Muell. in *Herb. Hook.* A glabrous erect annual, 6 in. to above 1 ft. high, slender and scarcely branched. Leaves few at the base of the stem, petiolate, broadly ovate, entire or obscurely toothed, under $\frac{1}{2}$ in. long, the stems otherwise leafless except the minute floral leaves or bracts, and sometimes a single pair of minute leaves lower down. Flowers in irregular racemes, occupying nearly the upper half of the stem, the pedicels rarely above $\frac{1}{4}$ in. long. Calyx-segments linear, about 1 line long. Corolla-tube slender and twice as long as the calyx, "the throat closed," the lower lip spreading, very broad, 3-lobed, with the middle lobe notched, longer than the tube, the upper lip shorter and slightly notched. Anthers cohering, with divaricate cells confluent so as to appear 1-celled; staminodia totally adnate, forming prominent ridges in the throat of the corolla. Capsule oblong-linear, about 2 lines long.—*Vandellia clausa*, F. Muell. in Trans. Phil. Inst. Vict. iii. 60; *Lindernia clausa*, F. Muell. Fragm. vi. 102.

N. Australia. Sand plains, Victoria river, *F. Mueller*. There are very few corollas on the specimens, and their texture is so delicate that I was unable to verify all the particulars described by F. Mueller in the only one I could examine.

SUBTRIBE III. LIMOSELLEÆ.—Small creeping or prostrate herbs with opposite or clustered leaves. Corolla usually minute, with a short tube and 5 lobes nearly equal or one or two rather larger than the others, the aestivation apparently variable. Anthers 1-celled.

The little plants here collected together are evidently nearly allied to each other, although formerly, from differences imperfectly observed in their aestivation, I had placed them in different tribes. They are very difficult to examine in the dried state, and some are often mixed in collections with one another or with *Montia fontana* and *Elatine americana*.

16. PEPLIDIUM, Delile.

Calyx tubular, 5-angled, 5-toothed or shortly 5-lobed. Corolla with a short tube and 5 nearly equal lobes. Stamens 2, the filaments somewhat dilated at the base; anthers 1-celled (by the confluence of 2 divaricate cells?). Ovary completely 2-celled. Style short, dilated upwards into a broad spatulate lamina curved over the stamens. Capsule globular or ovoid, indehiscent or irregularly bursting (or sometimes 4-valved?).—Small creeping or prostrate herbs. Leaves opposite. Flowers very small, axillary, without bracteoles.

The genus is limited to the two Australian species, of which one is widely diffused over the warmer regions of Asia and Africa, the other is endemic. The genus ought, perhaps, to

be reunited with *Microcarpaea*, in which Smith had placed the common species. The anthers appear to have been erroneously described as bilocular.

Flowers sessile or nearly so. Capsule globular, obtuse 1. *P. humifusum*.
Flowers distinctly pedicellate. Capsule ovoid, acute 2. *P. Muelleri*.

1. ***P. humifusum***, *Delile*; *Benth. in DC. Prod.* x. 422. A dwarf prostrate glabrous plant, creeping and rooting at the nodes, sometimes forming dense tufts of 2 or 3 in. diameter, sometimes spreading to a considerable extent. Leaves ovate obovate or orbicular, obtuse, entire, contracted into a short petiole, rather thick especially when small, $\frac{1}{4}$ to $\frac{1}{2}$ in. long or rarely rather larger (in very wet situations?), the short petioles of each pair connected by their membranous margins. Flowers sessile or nearly so in the axils. Calyx scarcely above 1 line at the time of flowering, with 5 prominent angles or folds and membranous between them, the teeth short and obtuse. Corolla-tube rather shorter than the calyx, the lobes very short and rounded. Filaments rather thick, especially towards the base, angularly incurved. Capsule globular, large for the plant, very obtuse, enclosed in the distended calyx, about $1\frac{1}{2}$ lines diameter, membranous and indehiscent or at length bursting irregularly towards the base.—*Microcarpaea cochlearifolia*, Sm.; Hook. Bot. Misc. iii. 95. t. suppl. 29, and other synonyms quoted in the 'Prodromus.'

N. Australia. Upper Victoria river, *F. Mueller*.

Queensland. Rockhampton, *O'Shaunessy*; Cape river, *Bowman*; between the Darling and the Lachlan rivers, *Burkitt*.

The species extends over the greater part of tropical and subtropical Asia and Africa.

2. ***P. Muelleri***, *Benth.* Stems procumbent, much firmer than in *P. humifusum*, and not rooting at the nodes, glabrous or sparingly scabrous-pubescent. Leaves petiolate, ovate or obovate, very obtuse, entire, rather thick, 4 to 8 lines long. Flowers usually 2 together in each axil, on pedicels of 1 to 2 lines. Calyx tubular, $1\frac{1}{2}$ lines long, 5-angled, with obtuse teeth. Corolla-tube nearly as long as the calyx; lobes oval-oblong, at least half as long as the tube, with 2 very prominent ridges (rudiments of staminodia?) in the throat opposite the sinus of the lower lobes, which are entirely wanting in *P. humifusum*. Filaments scarcely curved. Capsule ovoid, acute, readily opening in 2 or 4 valves, although not quite ripe in our specimens.

N. Australia. Upper Victoria river, *F. Mueller*. Several specimens of this are in the Hookerian herbarium, sent by *F. Mueller* as a large-leaved variety of *P. humifusum*; but, besides the foliage, the pedicellate and longer flowers, the shape of the corolla, the stamens and the fruit appear to me to be quite different from those of *P. humifusum*, which is remarkably constant in its character throughout its very extended range.

17. MICROCARPÆA, R. Br.

Calyx tubular, 5-angled, 5-toothed. Corolla with a short tube and 5 nearly equal lobes (the 2 upper more united, the lowest rather larger). Stamens 2; filaments filiform; anthers 1-celled (by the confluence of 2 divaricate cells). Ovary completely 2-celled. Style short, dilated upwards into a broad spatulate lamina curved over the stamens. Capsule ovoid, included in the calyx, opening loculicidally in 2 entire valves, leaving the transverse

dissepiment free.—Small creeping herb. Leaves opposite. Flowers very small, axillary, without bractcoles.

The genus, as now constituted, is limited to the single Australian species, which extends into tropical Asia. If, however, the dehiscence of the capsule be neglected, it might include *Peplidium*, and even *Glossostigma* might be added as a section, differing chiefly in the calyx.

1. **M. muscosa**, *R. Br. Prod.* 436. A dwarf slender intricately-branched prostrate plant, creeping and rooting at the nodes, nearly glabrous or the margins of the leaves, angles of the stems and calyxes ciliate with small rigid hairs. Leaves sessile, linear, narrow-oblong or linear-lanceolate, obtuse, entire, under 2 lines long. Flowers all but sessile in the axils, usually one only to each pair of leaves. Calyx $\frac{3}{4}$ line long, prominently angled, with 5 acute ciliate teeth. Corolla-tube shorter than the calyx and the lobes very shortly exceeding it. Stamens nearly as long as the corolla. Capsule much shorter than the calyx.—*Benth. in DC. Prod.* x. 433.

N. Australia. Near Macadam Range, *F. Mueller*.

Queensland. Shoalwater Bay, *R. Brown*.

18. GLOSSOSTIGMA, Arn.

(*Tricholoma*, *Benth.*)

Calyx campanulate, obtusely 3- or 4-lobed, the upper lobes sometimes slightly notched. Corolla very small, with a short tube and 5 nearly equal lobes (the 2 upper more united, the lowest rather larger). Stamens 2 or 4; filaments filiform; anthers 1-celled (by the confluence of 2 diverging or divaricate cells). Style short, dilated upwards into a broad spatulate lamina curved over the stamens in the bud. Capsule globular or ovoid, included in the calyx, opening loculicidally in 2 entire valves, leaving the placental column free.—Small creeping herbs. Leaves opposite but often clustered at the nodes. Flowers very small, on axillary pedicels, without bractcoles.

The genus is apparently limited to the three Australian species, of which one extends to tropical Asia and Africa, another to New Zealand, and the third is endemic. It differs from *Microcarpaea* in the calyx, from *Limosella* in the opposite leaves, in the calyx, style, ovary and capsule. *F. Mueller* has, however, (in his herbarium as well as in *Fragni.* vi. 104,) united the three species under the name of *Limosella Drummondii*.

Stamens 2 (**Glossostigma**) 1. *G. spathulatum*.

Stamens 4 (**Tricholoma**).

Calyx usually 3-lobed. Stamens as long as or exceeding the very short corolla-lobes 2. *G. Drummondii*.

Calyx 4-lobed. Stamens much shorter than the ovate fringed corolla-lobes 3. *G. elatinoides*.

1. **G. spathulatum**, *Arn.; Benth. in DC. Prod.* x. 426. A very slender and minute intricately-branched glabrous plant, creeping and rooting at the nodes. Leaves linear-spathulate, obtuse, entire, 1 to 2 lines long, but usually tapering into a much longer petiole. Pedicels slender, scarcely exceeding the leaves. Calyx scarcely above $\frac{1}{2}$ line long, 3-lobed. Corolla scarcely exceeding the calyx, with very small blue entire lobes. Stamens 2, nearly as long as the corolla. Capsule not exceeding the calyx, opening loculicidally in 2 valves.—*Microcarpaea spathulata*, *Hook. Bot. Misc.* ii. 101. t. suppl. 4.

Queensland. Rockhampton, *O'Shannessy*, who observes that the numerous little blue flowers look like tiny drops of dew. The species is dispersed over tropical Asia and Africa.

2. **G. Drummondii**, *Benth. in DC. Prod.* x. 426. A minute glabrous plant, creeping and rooting at the nodes like *G. spathulatum*. Leaves linear-spathulate or oblong, entire, 1 to 2 lines long, but narrowed into a slender petiole sometimes much longer than the lamina. Pedicels usually longer than the leaves. Calyx scarcely above $\frac{1}{2}$ line long, 3-lobed as in *G. spathulatum*, one lobe often broader than the others. Corolla slightly exceeding the calyx, with short rounded lobes not fringed. Stamens 4, as long as or sometimes longer than the corolla. Capsule nearly globular, not exceeding the calyx, opening loculicidally in 2 valves.

W. Australia, *Drummond*, n. 19, 109, *4th Coll.* n. 111 (mixed with sessile depressed-globular fruits probable of an *Elatine* and with other minute plants); Murchison river, *Oldfield*, foot of the Stirling Range, *F. Mueller* (luxuriant specimens with long petioles and pedicels, and mixed with *Limosella*).

3. **G. elatinoides**, *Benth. in Hook. Fl. N. Zeal.* i. 189. A small glabrous intricately-branched moss-like plant, creeping and rooting at the nodes, but often rather longer and more leafy than the two preceding species. Leaves linear-spathulate or oblong, obtuse, entire, rarely above 2 lines long, narrowed into a petiole as long as the lamina or shorter. Pedicels shorter than the leaves. Calyx $\frac{3}{4}$ lines long, with 4 short broad very obtuse lobes. Corolla-tube nearly as long as the calyx; lobes ovate, much longer than in *G. Drummondii*, though still very small, the lower one rather larger than the others, all fringed with minute cilia. Stamens 4, shorter than the corolla. Ovary 2-celled. Capsule not seen ripe. —Hook. f. *Fl. Tasm.* i. 292; *Tricholoma elatinoides*, *Benth. in DC. Prod.* x. 426.

N. S. Wales. Glendon, *Leichhardt*; Tumbarumba, *W. P. Ball*.

Victoria. Goulburn, Broken, Latrobe, Yarra, and Murray rivers, *F. Mueller*.

Tasmania. Banks of the Esk, near Launceston, *Gunn*.

The species is also in New Zealand. I have searched in vain our rather numerous specimens without succeeding in finding a single ripe capsule to show its dehiscence.

19. LIMOSELLA, Linn.

Calyx campanulate, 5-toothed or lobed. Corolla broadly campanulate or almost rotate, with 5 nearly equal lobes. Stamens 4. Anthers 1-celled (by the confluence of 2 divaricate cells). Ovary 2-celled at the base only. Style short, thickened at the end. Capsule globular, membranous, scarcely dehiscent or opening in 2 valves parallel to the very incomplete dissepiment. —Small herbs, tufted creeping or floating. Leaves clustered or alternate on short barren shoots. Peduncles usually very short, clustered with the leaves, without bracteoles. Flowers in the common species very small, larger in some S. African ones.

Besides the Australian species, which appears to be the same as the one which spreads over the northern hemisphere and the whole of western America, there are one or two from S. Africa with much larger flowers and broader leaves.

1. **L. aquatica**, *Lam.*; *Benth. in DC. Prod.* i. 426. A glabrous an-

nal, forming little tufts of 1 or 2 in. diameter, and occasionally emitting creeping shoots terminating in another tuft or rarely short barren branches with alternate leaves. Leaves chiefly clustered in the tufts, almost linear in the common Australian form, more oblong in Europe and Asia but variable in both countries, obtuse and entire, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, besides a petiole often twice as long. Flowers clustered with the leaves on very short pedicels. Calyx about 1 line long. Corolla very shortly exceeding the calyx, the lobes shortly ovate. Capsule ovoid-globular, exceeding the calyx when perfect.—Hook. f. Fl. Tasm. i. 292; *L. tenuifolia*, Nutt.; Benth. in DC. Prod. x. 427; *L. australis*, R. Br. Prod. 443.

N. S. Wales. Near Mudgee, *Woolle*.

Victoria. Avoca river, Station Peak, *F. Mueller*; near Portland, *Allitt*.

Tasmania. Port Dalrymple and Kent's Island, Bass's Straits, *R. Brown*; probably common in marshy situations, though frequently overlooked, *J. D. Hooker*.

S. Australia. Kangaroo Island, *R. Brown*; Light river and Mount Remarkable, *F. Mueller*.

W. Australia. Gordon river, *Oldfield*; foot of Stirling Range, mixed with *Glossostigma Drummondii*, *F. Mueller*.

The species extends nearly the whole length of western America with the same usually narrower rarely broader leaves as in Australia, and over a great part of Europe and temperate Asia usually with rather broader leaves.

SUBORDER III. RHINANTHIDEÆ.—Corolla either with 4, 5 (or rarely more in genera not Australian) spreading lobes, variously imbricated in the bud, the upper ones very rarely outside, or 2-lipped with the upper lip inside. Inflorescence centripetal or very rarely in genera not Australian compound.

It is only in the first two genera and a few non-Australian *Sibthorpica* that the activation is doubtful or variable; in all the rest of the suborder the upper lip or lobes are invariably inside in the bud.

20. CAPRARIA, Linn.

Calyx divided to the base into 5 equal segments. Corolla broadly campanulate, divided to below the middle into 5 nearly equal lobes, imbricate in the bud. Stamens 4 or rarely 5, shorter than the corolla; anthers sagittate, the cells confluent at the top. Style thickened at the end, the stigma obtuse, with 2 diverging lobes at the base. Capsule ovate, obtuse, opening loculicidally in 2 valves at length 2-fid and leaving a free placentiferous column. Seeds numerous, small, with a reticulate testa.—Perennials or undershrubs. Leaves alternate, serrate. Pedicels axillary, usually 2 together, without bracteoles.

The genus consists of a very few American species. The only Australian one, if a true congener, appears to be endemic.

1. **C. calycina**, *A. Gray* in *Proc. Amer. Acad.* vi. 19. Low and glabrous. Leaves lanceolate or linear, with few coarse divaricate teeth near the base. Flowers solitary in the axils, on pedicels of 3 or 4 lines. Calyx-segments leafy, 4 lines long when in flower, $\frac{1}{2}$ in. when in fruit, sometimes slightly denticulate. Corolla not exceeding the calyx. Stamens 4. Stigma emarginate.

N. S. Wales. Hunter's River, *American Exploring Expedition*. This plant is only

known to me from A. Gray's character, from which the above is taken. We have no specimen, and it has not, as yet, turned up in any other collection.

21. SCOPARIA, Linn.

Calyx divided to the base into 4 or 5 segments. Corolla rotate, 4-lobed, hairy at the throat, the lobes imbricate in the bud. Stamens 4; anthers sagittate. Style slightly club-shaped at the top, truncate or emarginate. Capsule opening septicidally in 2 entire valves, leaving the placental column free.—Much-branched herbs or low undershrubs. Leaves opposite or whorled. Pedicels axillary, usually 2 together, without bracteoles.

The genus consists of but few species, all South American, including the Australian one, which is now a common weed in almost all tropical regions.

1. **S. dulcis**, Linn.; *Beeth. in DC. Prod.* x. 431. A much-branched glabrous annual (or sometimes perennial?), erect or decumbent at the base, 1 to 3 ft. high. Leaves usually in whorls of 3, oblong-lanceolate or the upper ones linear in the Australian specimens, the lower ones broader, in some American ones dentate, narrowed into a petiole often rather long, the lamina varying from $\frac{1}{2}$ to $1\frac{1}{2}$ in. Flowers numerous, small, white, on filiform pedicels of 2 to 4 lines. Calyx-segments 4, ovate-oblong, about 1 line long. Corolla about 3 lines diameter. Capsule rather longer than the calyx.—R. Br. *Prod.* 443.

N. Australia. Gulf of Carpentaria, *F. Mueller*.

Queensland. Broad Sound, *R. Brown, Bauman*; Shoalwater Bay, *R. Brown*; Lizard Island, *M. Gellert*; Nerseel Creek, *B. ...*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy, O'Shanesy*.

The species is supposed to be of American origin, now a common tropical weed.

22. VERONICA, Linn.

Calyx deeply divided into 4 or rarely 5 segments. Corolla either rotate or with a distinct tube and spreading limb; lobes 4 or very rarely 5, imbricate in the bud, the lateral ones or one of them outside. Stamens 2, inserted in the tube and exerted from it; anthers with confluent cells, without points or awns. Style filiform, with an undivided somewhat capitate stigma. Capsule compressed or turgid, furrowed on each side, either septicidally dehiscent with the placentas separating or loculicidally dehiscent with the valves remaining adherent to the undivided placental column, or separating from it and septicidally bifid. Seeds ovate or orbicular, compressed, attached by the inner flat concave or slightly convex surface, the outer surface more or less convex.—Herbs undershrubs or shrubs. Leaves opposite or rarely the upper ones alternate, the floral leaves or bracts always alternate. Flowers blue pink or white, solitary in the axils of the floral leaves or bracts, without or very rarely with bracteoles, forming usually terminal or axillary racemes.

A large genus, abundant in the temperate and colder regions of the northern hemisphere, in New Zealand, and the Antarctic regions, ascending to great elevations and high latitudes, with a very few tropical species, and those chiefly in mountain regions or descending along streams. Of the fifteen Australian species, one is a common American weed, probably introduced in Australia, another is equally common in the temperate regions of the New and the Old World, as well as in tropical mountains, and may be indigenous in Australia; a third is apparently the same as a New Zealand species; the remaining twelve are endemic.



SECT. I. *Hebe*.—Evergreen shrubs or densely tufted or tall and erect herbs. Leaves all opposite. Flowers in axillary racemes, very rarely reduced to single flowers. Capsule more or less turgid and septicidally dividing when ripe, at least at the top.

Densely tufted dwarf perennial, with small decussate leaves. Flowers sessile, solitary, with 2 bracteoles 1. *V. densifolia*.

Erect much-branched shrubs. Racemes short, loose, in terminal corymbose leafy panicles.

Leaves rather crowded, ovate to lanceolate, under $\frac{1}{2}$ in. long 2. *V. formosa*.

Leaves linear, $\frac{2}{3}$ to $1\frac{1}{2}$ in. long, usually distant 3. *V. decorosa*.

Stems from a perennial base tall, simple or nearly so. Racemes elongated, many-flowered.

Leaves ovate, stem-clasping and mostly connate, entire or rarely toothed, glaucous 4. *V. perfoliata*.

Leaves broadly lanceolate, serrate 5. *V. Derwentia*.

Leaves linear or linear-lanceolate, entire or serrate 6. *V. arenaria*.

SECT. II. *Chamædrys*.—Herbs from a perennial usually creeping rootstock, diffuse, ascending or erect. Leaves all opposite. Flowers in axillary racemes. Capsule compressed, the valves not separating from the placental columns.

Leaves deeply divided into linear segments. Stems tall 7. *V. nivea*.

Leaves toothed or entire.

Leaves narrow-lanceolate, entire or rarely toothed, mostly sessile 8. *V. gracilis*.

Leaves ovate-lanceolate, acutely toothed, sessile or scarcely petiolate. Stems glabrous or minutely pubescent. Flowers small 9. *V. arguta*.

Leaves ovate or ovate-lanceolate, toothed, shortly petiolate. Stems glabrous pubescent or hirsute. Flowers large 10. *V. distans*.

Leaves more petiolate, rounded truncate or cordate at the base.

Leaves broadly ovate, mostly $\frac{1}{2}$ to 1 in. long.

Stems hirsute with long hairs, long and procumbent or short and erect. Calyx-segments large, obtuse, ciliate 11. *V. calycina*.

Stems slender, shortly pubescent, long and procumbent, rarely short and erect. Calyx-segments rather acute 12. *V. plebeia*.

Leaves ovate-lanceolate, 1 to 3 in. long. Stems erect, often tall, loosely pubescent or hirsute 13. *V. notabilis*.

SECT. III. *Veronicastrum*.—Annual or perennial herbs, usually decumbent or small. Stem-leaves opposite, passing into the alternate floral leaves or bracts. Racemes or spikes terminal, simple, the lower bracts like the stem-leaves. Capsule as in *Chamædrys*.

Plants perennial, decumbent, and rooting at the base. Flowers distinctly pedicellate 14. *V. serpyllifolia*.

Annual. Flowers sessile or nearly so 15. *V. peregrina*.

All the Australian species, except *V. densifolia*, have the corolla rotate or nearly so, with a very short tube, and none have bracteoles except the same *V. densifolia*: the bracts subtending the pedicels are small and narrow in all except the section *Veronicastrum*. The several species of the section *Chamædrys*, with the exception of *V. nivea*, appear connected by so many intermediate forms that their delimitation is, as here given, very unsatisfactory.

SECT. I. *Hebe*.—Evergreen shrubs or densely tufted or tall and erect perennial herbs. Leaves all opposite. Flowers in axillary racemes, reduced in *V. densifolia* to single flowers. Capsule more or less turgid and septicidally dividing when ripe, at least at the top, where it is then more or less 4-valved.

4. *V. densifolia*, *F. Muell. Fragra.* ii. 137 and *Lithogr.* t. 63. A small densely tufted much-branched prostrate or shortly creeping perennial,

the short ascending branches not above 1 in. high. Leaves densely crowded and decussate, entirely covering the branches, ovate, very obtuse and thick, keeled underneath, under 2 lines long, minutely ciliate at the base, otherwise glabrous. Flowers sessile in the uppermost axils, with a pair of oblong bracteoles at their base shorter than the calyx. Calyx about 3 lines long, divided to the middle into 5 equal obtuse lobes, ciliolate and glandular-pubescent. Corolla, when apparently normal, with a distinct tube of $1\frac{1}{2}$ lines and 5 oblong nearly equal lobes of about 2 lines, but in most of the flowers 1, 2 or 3 of the lobes are very broad or there is an additional sixth lobe inside. Capsule "shorter than the calyx, $1\frac{1}{2}$ lines long, obcordate, pubescent in the notch."—*Poederota densifolia*, F. Muell. in Hook. Kew Journ. viii. 202, and in Trans. Phil. Soc. Vict. i. 107.

N. S. Wales. Summits of Mount Kosciusko on the Victorian frontier, *F. Mueller*.

Victoria. Highest summits of the Mynyong Mountains at an elevation of 6000 to 6500 ft., *F. Mueller (Herb. Hook.)*.

In habit this is allied to the N. Zealand *V. tetragona* and its allies; the multiplication of the calycine and corolla-lobes is like that of the N. Zealand genus or section *Pygmaea*, Hook. f.; the inflorescence is peculiar. The specimens are not numerous, and I could only analyse two flowers; one was regular with the stamens perfect, the other had some of the corolla-lobes enlarged, with a sixth inner one as figured by F. Mueller; but there I found one of the anthers enlarged and probably sterile, and the other entirely replaced by the sixth corolla-lobe.

2. **V. formosa**, *R. Br. Prod.* 434. A beautiful evergreen corymbosely branched shrub, attaining 2 to 3 or 4 ft., glabrous except a short pubescence decurrent from the margins of the leaves on opposite sides of the stem. Leaves rather crowded, oval-oblong or lanceolate, entire or very rarely obscurely toothed, thick, often recurved, usually about $\frac{1}{4}$ in. long, but from that to $\frac{1}{2}$ in. when narrow. Flowers pale lilac, in short loose racemes in the upper axils, forming terminal leafy corymbs. Calyx 1 to $1\frac{1}{2}$ lines long, deeply divided into 5 nearly equal lobes or one smaller than the others. Corolla-lobes at least 3 lines long. Capsule oblong, acute or obtuse, considerably longer than the calyx, turgid at the base and readily septicial.—Benth. in DC. Prod. x. 462; Hook. f. Fl. Tasm. i. 293; *V. diosmaefolia*, Knowles and Weste. Fl. Cab. iii. 65. t. 106, not of A. Cunn.

Tasmania. Port Dalrymple and Mount Wellington, *R. Brown*; common on rocky hills in various parts of the island, *J. D. Hooker*.

3. **V. decorosa**, *F. Muell. in Linnaea*, xxv. 430. An erect branching shrub of several feet, with minute pubescent lines decurrent from the margins of the leaves, otherwise glabrous. Leaves sessile, linear, entire or rarely toothed, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Flowers white or pink with dark streaks, in rather loose racemes in the upper axils, rarely twice as long as the leaves, and forming, in good specimens, handsome corymbosely leafy panicles. Pedicels longer than the calyx. Calyx-segments acute, 2 to $2\frac{1}{2}$ or rarely 3 lines long. Corolla-lobes fully 4 lines long, the upper one broader and the lower one narrower than the others. Capsule turgid, very obtuse and slightly notched, as broad as or broader than long and much shorter than the calyx, but not quite ripe in the specimens.

S. Australia. Rocky valleys of the Flinders Range, from Mount Remarkable to Mount Brown, *F. Mueller*; Mount Scarl, *Warburton*.

F. Mueller (Fragm. vi. 102) reduces this to *V. arenaria*, A. Cunn., but that was probably without actual comparison of specimens, for Cunningham's plant has tall simple herbaceous stems with long racemes and short pedicels, and is more nearly allied to *V. Derwentia*.

4. **V. perfoliata**, R. Br. Prod. 431. Stems from a perennial or shortly shrubby base erect, but often flexuose, simple or slightly branched, attaining several feet, the whole plant glabrous and usually glaucous. Leaves stem-clasping and often more or less connate by their broad bases, ovate or ovate-lanceolate, acuminate or acute, quite entire or with a few prominent teeth, 1 to 2 or rarely 3 in. long. Flowers of a bluish violet streaked with purple, in long slender racemes in the upper axils. Calyx-segments 4, linear, rather unequal, $1\frac{1}{2}$ to 2 lines long. Corolla-lobes $2\frac{1}{2}$ to above 3 lines long, rather unequal, nearly rotate but obscurely 2-lipped as in *V. Derwentia*. Capsule ovoid or oblong, turgid at the base, readily septicial.—Benth. in DC. Prod. x. 463; Bot. Mag. t. 1936; Bot. Reg. t. 1930; Lodd. Bot. Cab. t. 781; *V. imperfoliata*, Benth. in DC. Prod. x. 463.

N. S. Wales. Blue Mountains, R. Brown, A. Cunningham, and others; on the Murrumbidgee, McArthur; Mount Mitchell, Becker; southward to Twofold Bay, F. Mueller.

Victoria. Forest Creek, Fuller's Range, Ovens and Broken rivers, Mount M'Ivor, Grampians, etc., usually indicating auriferous regions, F. Mueller.

5. **V. Derwentia**, Andr. Bot. Rep. t. 531. Stems from a perennial base erect, simple, 2 to 3 ft. high, glabrous as well as the foliage except a few cilia at the junction of the leaves, and sometimes a slight pubescence in 2 decurrent lines on the stem, or the inflorescence shortly pubescent. Leaves sessile, broadly lanceolate, acuminate, serrate, attaining 3 or 4 in. Flowers pale blue or white, rather crowded, in racemes often 6 to 8 in. long in the upper axils. Calyx about $1\frac{1}{2}$ lines long, divided to below the middle into 4 lanceolate or almost linear lobes, with usually a small upper fifth lobe. Corolla-lobes rather broad, acute, nearly 3 lines long, not very unequal but obscurely arranged in 2 lips. Capsule ovoid or oblong, obtuse or acute, turgid at the base, exceeding the calyx, readily septicial.—*V. liliata*, R. Br. Prod. 434; Benth. in DC. Prod. x. 463; Hook. f. Fl. Tasm. i. 293; Bot. Mag. t. 1660, and 3461.

N. S. Wales. Blue Mountains, Macquarrie river, and to the west of Bathurst, A. Cunningham; Tweed river, C. Moore; Clarence river, Becker; Mount Lindsay, W. Hill; and southward to Twofold Bay, A. Cunningham; Maneroo plains, Lhotsky.

Victoria. Port Phillip, R. Brown; Loddon river, Creswick Creek, Mount Disappointment, Grampians, F. Mueller; Ballarook forest, Whan; mouth of the Glenelg, Allett.

Tasmania. Port Dalrymple, R. Brown; abundant in many places, especially in the northern and central parts of the island, J. D. Hooker.

S. Australia. Near Adelaide, Blandowsky; Bugle Range, F. Mueller.

R. Brown does not state for what reason he rejected Andrews's older name, which he quotes as given by Littlejohn, probably from private information. This, however, can scarcely be recognized, as it does not appear to have been previously published, nor is Littlejohn referred to by Andrews in the Repository.

6. **V. arenaria**, A. Cunn.; Benth. in DC. Prod. x. 463. Stems from a perennial (or suffrutescent?) base, erect, simple or nearly so, 1 to 2 ft. high, glabrous as well as the foliage. Leaves sessile, linear or rarely linear-lanceo-

late, entire or with a few prominent teeth, rather thick, 1 to 2 in. long. Flowers in rather slender virgate racemes of $\frac{1}{2}$ to 1 ft. in the upper axils, the pedicels very short. Calyx-segments very narrow, about 1 line long when in flower, but lengthening to 2 lines. Corolla-lobes acute, 3 to 4 lines long. Capsule oval-oblong, emarginate, often exceeding the calyx, turgid and septicidal when quite ripe.—*V. pulchra*, G. Don in Loud. Hort. Brit. 7; *V. dianthifolia*, A. Cunn. in Loud. l. c. 467.

N. S. Wales. Arid sandy flats in the plains of Daby on the Cuzegong river, *A. Cunningham*.

SECT. II. CHAMEDRYS.—Herbs, from a perennial usually creeping rootstock, diffuse ascending or erect. Leaves all opposite. Flowers in axillary racemes. Capsule compressed, opening loculicidally on the margin, the valves not separating from the narrow placental column.

7. **V. nivea**, *Lindl. Bot. Rey.* 1842, *Misc.* 42. Stems from a perennial probably creeping rootstock, ascending or erect, $\frac{1}{2}$ to 1½ ft. high, the whole plant glabrous or the inflorescence minutely pubescent. Leaves pinnately divided into linear entire or toothed or pinnatifid segments. Flowers in rather dense racemes of 2 or 3 in., terminal or in the upper axils, the pedicels short. Calyx-segments lanceolate, unequal, 1 to 1½ lines long. Corolla-lobes obtuse, not 2 lines long. Capsule compressed, broadly obovate, longer than the calyx, opening loculicidally along the margin, the valves remaining attached to the placental column in the centre.—Benth. in DC. Prod. x. 471; Hook. f. Fl. Tasm. i. 294.

Victoria. Mount Latrobe, Baw-Baw Mountains, Mount Wellington in Gipps' Land, *P. Mueller*.

Tasmania. In alpine situations, rather local, *J. D. Hooker*; Mount Wellington, *Gunn*; Western Mountains and Lake Arthur, *Lawrence*.

8. **V. gracilis**, *R. Br. Prod.* 435. Stems from a creeping rootstock ascending or erect, simple or slightly branched, rarely above 6 in. high and sometimes not above 2 in., glabrous as well as the whole plant, or with a line of hairs decurrent on each side from the margins of the leaves. Leaves sessile or very shortly petiolate, lanceolate or linear, acute, entire or rarely with very few prominent teeth, $\frac{1}{2}$ to 1 in. long, the floral ones shorter. Racemes in the upper axils loose but short and almost corymbose, on peduncles longer than the leaves, the pedicels slender, as long as or longer than the calyxes. Calyx-segments lanceolate, acute, from 2 to above 3 lines long. Corolla-lobes broad, rounded, scarcely exceeding the calyx. Capsule broad, half as long as the calyx, slightly notched, somewhat glandular-pubescent, compressed, but not seen quite ripe.—Benth. in DC. Prod. x. 478; Hook. f. Fl. Tasm. i. 295.

N. S. Wales. Argyle county, *M'Arthur* (the Port Jackson station given in the 'Prodromus' was probably a mistake in Herb. Lambert).

Victoria. Glenelg, Yarra, and Macalister rivers and Maroka valley, at an altitude of 4000 ft., *P. Mueller*; Creswick Range, *Whan*.

Tasmania. Port Dalrymple, *R. Brown*; moist places, common in many parts of the island, *J. D. Hooker*.

S. Australia. Onkaparinga river, *P. Mueller*.

9. **V. arguta**, *R. Br. Prod.* 435. Stems from a creeping rootstock ascending or erect, very slender, slightly pubescent. Leaves nearly sessile or the lower ones shortly petiolate, ovate or ovate-lanceolate, acute and acutely toothed, truncate or almost cordate at the base, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Racemes in the upper axils almost filiform, with few small distant flowers on slender pedicels. Calyx scarcely above 1 line long when in flower and not 2 lines when in fruit. Corolla-lobes broad, obtuse, about 2 lines long. Capsule broad, but not seen ripe.

N. S. Wales. Grose river, *R. Brown*. This may possibly prove to be a slender small-flowered form of *V. distans*, or a broad-leaved variety of *V. gracilis*, to both of which it appears to me to be nearer allied than to *V. plebeia*.

10. **V. distans**, *R. Br. Prod.* 435. Stems from a creeping rootstock ascending or erect, simple or branched, rarely above 6 in. high, glabrous pubescent or rarely hirsute, the hairs usually in opposite lines but sometimes almost round the stem. Leaves sessile or shortly petiolate, from ovate to lanceolate, coarsely toothed or very rarely nearly entire, $\frac{1}{2}$ to 1 in. long, glabrous or sprinkled with a few hairs underneath. Flowers white streaked with lilac, rather large, often only 2 or 3 and never numerous, in rather loose pedunculate racemes in the upper axils, appearing often at first terminal, and often only 1 or 2 racemes to the stem. Calyx-segments usually broad, 2 to 3 lines long, acute or obtuse. Corolla larger than in *V. gracilis*, the broad round lobes at least 4 lines long in many specimens. Capsule broadly obcordate, as long as the calyx, opening loculicidally, the valves adhering to the placental column. Seeds slightly incurved, closely packed.—Benth. in DC. *Prod.* x. 478; Hook. f. *Fl. Tasm.* i. 204; *V. Drummondii*, Benth. in DC. *Prod.* x. 478; *V. Hildebrandii*, F. Muell. in *Trans. Phil. Soc. Vict.* i. 49, and in Hook. *Kew Journ.* viii. 202.

S. Australia. Limestone cliffs on Lake Alexandrina, along the Coorong and near Spencer's Gulf, *P. Mueller*; Lake Hamilton, *Wilhelmi*.

W. Australia. *Drummond*, 1st coll.; King George's Sound, *R. Brown*. These, as well as the South Australian forms, nearly glabrous and the leaves often rather thick.

Var. ? *pubescens*. More pubescent, the leaves rather more distinctly petiolate, and the calyx-segments more obtuse, almost intermediate between *V. distans* and *V. calycina*.—*V. Nova-Hollandie*, Poir. *Dict.* viii. 526 ?

Tasmania. Recherche Bay, *Labillardiere*, *C. Stuart*; common on the sand hills near Circular Head, *Gunn*.

11. **V. calycina**, *R. Br. Prod.* 435. Stems from a creeping rootstock either procumbent, spreading to a considerable extent and rooting at the lower nodes, or some of the flowering ones usually ascending or erect, from a few inches to nearly 1 ft. long, more or less hirsute, the hairs usually rather long and in 2 opposite rows but sometimes nearly all round the stem. Leaves more petiolate than in the preceding species, broadly ovate, coarsely crenate-toothed, rounded truncate or cordate at the base, from under $\frac{1}{2}$ in. to 1 in. or rarely rather more in length and often almost as broad, the floral ones smaller and sometimes more sessile and narrower. Flowers in the ascending stems in pedunculate few-flowered rather loose axillary racemes, or on the procumbent stems almost reduced to clusters, the pedicels long with a very short common peduncle. Calyx-segments broadly ovate, obtuse,

ciliate, usually about 2 lines long when in flower but soon enlarged and sometimes twice that size and thin. Corolla-lobes obtuse, either scarcely exceeding the calyx or twice as long. Capsule compressed, broadly obcordate or truncate, shorter than the calyx. — Benth. in DC. Prod. x. 477; Hook. f. Pl. Tasm. i. 294; *V. stolonifera*, Lehm. Del. Sem. Hort. Hamb. 1842, and in Pl. Preiss. i. 342; Benth. in DC. Prod. x. 477 and 490 (from the character given); *V. cyenorum*, Miq. in Pl. Preiss. i. 342 (from the character given); *V. Gunnii*, Benth. in DC. Prod. x. 477.

Queensland. Burnett river, *F. Mueller* (apparently the same, but the specimens not sufficient).

N. S. Wales. Hastings river, *Beckler*.

Victoria. Port Phillip, *R. Brown*; Fitzroy river, *Robertson*; Loddon river, Bunip Creek, Bulalo and Dandenong ranges, Geampians, Wilson's Promontory, *F. Mueller*; Little river, *Fulagar*; Creswick Creek, *Whan*.

Tasmania. Port Dalrymple and Derwent river, *R. Brown*; common in rich soil throughout the colony, *J. D. Hooker*.

S. Australia. Rivoli Bay, *F. Mueller*; Kangaroo island, *Waterhouse*.

W. Australia. *Brown*, n. 99, 215, 4th cell. n. 159 (with very large calyxes); Kalgan river, *Oldfield*, *F. Mueller*.

Var. ? *longifolia*. Leaves narrow-ovate or ovate-lanceolate, 1 in. long or rather more. — Hampshire Hills, Tasmania, *Gouan*. Included by *J. D. Hooker*; Pl. Tasm. i. 295, among the forms of *V. arguta*, but with neither the stature nor the long acute leaves of the *V. notabilis*, still less is it the true *V. arguta*, Br., the whole species, however, although well-marked in its common typical form, varies occasionally so as to make it difficult to give any absolute character to distinguish it on the one hand from *V. distans*, and on the other from some forms of *V. plebeia*. The most northern stations may require further confirmation.

12. **V. plebeia**, *R. Br. Prod.* 435. Stems from a creeping rootstock procumbent, elongated and much more slender than in the other species, sometimes several feet long, occasionally rooting at the nodes, rarely emitting a tuft of erect branches of a few inches, usually minutely pubescent, without the long hairs of *V. calycina*. Leaves on rather long petioles, broadly ovate sometimes almost deltoid, deeply acutely and irregularly toothed, truncate or broadly cordate at the base, from under $\frac{1}{2}$ in. to about 1 in. long. Racemes as in *V. calycina*, sometimes rather slender pedunculate and 2 or even 3 in. long with the pedicels not much longer than the calyx, sometimes almost reduced to clusters of 2 or 3 flowers on long pedicels with a very short common peduncle. Calyx-segments about 2 lines long when in flower, and rarely above 3 when in fruit, rather acute and minutely ciliate. Corolla not much longer than the calyx. Capsule shorter than the calyx, compressed, nearly orbicular, not at all or only very slightly emarginate. — Benth. in DC. Prod. x. 478; *V. deltoidea*, Spreng. Syst. Cur. Post. 17.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*, *C. Stuart*; Maranoa river, *Mitchell*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 483, and others; northward to Hastings and Clarence rivers, *Beckler*; New England, *C. Stuart*; southward to the island of Tallaburga, *Mapleston*.

Victoria. Low bushy hills on the Yarra, Bunip Creek, Tanbo river in Gipps' Land, *F. Mueller*.

The New Zealand *V. elongata*, Benth. (*V. calycina*, A. Cunn. in Bot. Mag. under n. 3461), does not appear to be really distinct from *V. plebeia*.

13. **V. notabilis**, *F. Muell. Herb.* Stems from a creeping or decumbent base, ascending or erect, 1 ft. high or more, often much stouter than in the preceding species, loosely pubescent or hirsute. Leaves petiolate, ovate-lanceolate or lanceolate, acute and acutely toothed, 1 to 3 in. long. Racemes in the upper axils loose, 3 to 8 in. long, the pedicels usually longer than the calyx. Calyx-segments rather acute, 2 lines long when in flower, lengthening to 3 lines in fruit. Corolla not much exceeding the calyx, but not seen very perfect. Capsule shorter than the calyx, broad, truncate or slightly notched.

N. S. Wales. Grose river, *R. Brown*; Clarence river, *Beckler*; near Berwick, *Robinson*; Illawarra, *A. Cunningham*.

Victoria. Shady places, Dandenong Ranges, and Sealer's Cove, rare, *F. Mueller*.

Tasmania. St. Patrick's River, *Gunn*.

This species, which had been determined by A. Cunningham to be the *V. arguta* of Brown, and was included under that name by myself in the 'Prodrômus' and by Hooker in the 'Tasmanian Flora,' proves to be very different from Brown's plant, and apparently as distinct a species as any of the *Chamadrys* group in Australia except *V. nivea*.

SECT. III. VERONICASTRUM.—Annual or perennial herbs, usually decumbent or small. Stem-leaves opposite, passing into the alternate floral leaves or bracts. Racemes or spikes terminal, simple, the lower bracts leafy like the stem-leaves. Capsule compressed, opening loculicidally on the edges, the valves cohering in the centre to the narrow placental column.

14. **V. serpyllifolia**, *Linn.*; *Benth. in DC. Prod.* x. 482. A perennial with shortly creeping very much branched stems, forming a small flat dense leafy tuft, the flowering branches ascending from 2 in. to nearly $\frac{1}{2}$ ft., the whole plant minutely pubescent or nearly glabrous. Lower leaves shortly petiolate, the upper ones sessile or nearly so, ovate, obtuse, slightly crenate, rarely exceeding $\frac{1}{2}$ in. Flowers very small, of a pale blue or white with darker streaks, on pedicels of 1 to $1\frac{1}{2}$ lines or rarely nearly sessile, in a simple terminal raceme or spike, the subtending bracts, especially the lower ones, rather large and leaf-like and passing into the stem leaves. Calyx but little more than 1 line long at the time of flowering, somewhat enlarged in fruit. Corolla scarcely exceeding the calyx. Capsule broad, compressed, often rather deeply notched.

N. S. Wales. New England, *C. Stuart*.

Victoria. Snowy and Upper Mitta Mitta rivers, Mungong Mountains, and others of the Australian Alps at an elevation of 4000 to 5000 ft., *F. Mueller*.

The species is common in the temperate and colder regions of both the northern and southern hemispheres ascending to high latitudes and great elevations, and also in mountain ranges within the tropics.

15. **V. peregrina**, *Linn.*; *Benth. in DC. Prod.* x. 482. An annual with erect or ascending stems, simple or branching at the base, glabrous or minutely glandular-pubescent, usually about 6 in. high, but lengthening occasionally to 1 ft. Radical and lowest leaves petiolate and ovate but soon dying off, the others sessile, oblong or linear, entire or serrate, rarely exceeding $\frac{1}{2}$ in., passing into smaller alternate linear floral leaves or bracts. Flowers small, pale blue or white, sessile in the axils of the floral leaves or bracts,

forming a terminal interrupted leafy spike. Calyx-segments oblong, but little more than 1 line long, slightly enlarged after flowering. Corolla not exceeding the calyx. Capsule about as broad as long, compressed, slightly notched, about $1\frac{1}{2}$ lines diameter. Seeds very small.

N. S. Wales. Between the Lachlan and Darling rivers, *Burkitt*.

Victoria. Near Geelong, Forest Creek, Rocky river, *F. Mueller*.

Tasmania. South Esk river, *C. Stuart*.

W. Australia. *Drummond*, n. 443.

The species is common in extratropical America, rather less abundant within the tropics, and appears here and there in the Old World introduced from America. It is believed also to have been introduced only in all the above Australian localities.

23. *OURISIA*, Comm.

Calyx 5-lobed or 5-cleft. Corolla more or less oblique or curved, the tube very short or elongated; lobes 5, flat, imbricate in the bud, one of the lateral ones outside. Stamens 4, not exerted; anthers reniform, not mucronate, with confluent cells. Style filiform, with a capitate stigma. Capsule loculicidally 2-valved, the valves entire, carrying off the placentas along their centre. Seeds several, with a loose reticulate testa.—Perennial herbs, the stock often woody. Leaves opposite, sometimes all or nearly all radical. Flowers either solitary in the axils, or forming a raceme sometimes contracted to an umbel, on a scape-like peduncle, without bracteoles.

The genus comprises a considerable number of species from the Andes of S. America and New Zealand. The only Australian one appears to be endemic in Tasmania.

1. *O. integrifolia*, *R. Br. Prod.* 439. A small glabrous perennial, with a creeping stock, rooting at the nodes. Radical leaves on the stock or short barren shoots, ovate obovate or nearly orbicular, obtuse, entire, rather thick, $\frac{1}{4}$ to nearly $\frac{1}{2}$ in. long, narrowed into a petiole often as long as the lamina. Flowering stems erect, simple and 1-flowered or slightly branched, 2 to 3 in. high, bearing 1 or 2 pairs or whorls of 3 small sessile oblong-linear leaves, the flowers on long pedicels above the last pair. Calyx about 3 lines long, divided to much below the middle into oblong segments often minutely ciliate. Corolla nearly $\frac{1}{2}$ in. long, broadly and obliquely campanulate, tapering into a very short tube, the lobes all obtuse and rather longer than the entire part. Capsule ovate, about as long as the calyx.—Benth. in *DC. Prod.* x. 493; *Hook. f. Fl. Tasm.* i. 295.

Tasmania. Mount Wellington, *R. Brown*, *Gouan*, and others; not uncommon by alpine rivulets in shaded places, as Mount Wellington, the Western Mountains, etc., *J. D. Hooker*.

24. *SOPUBIA*, Hamilt.

Calyx campanulate, with 5 teeth or lobes, valvate in the bud. Corolla broadly campanulate, nearly rotate or tapering into a short tube, with 5 flat spreading lobes nearly equal. Stamens 4, the anthers cohering in pairs, each with one ovate scarcely mucronate perfect cell and one small stipitate empty cell. Style thickened and slightly flattened towards the end. Capsule ovate or oblong, truncate or notched, opening loculicidally in 2 entire or at length bifid valves.—Erect scabrous herbs, drying black. Leaves narrow, often

divided, opposite or the upper ones alternate.—Flowers yellow purple or pink, in terminal racemes or spikes, with a pair of bracteoles on the pedicel.

A small genus, dispersed over tropical Asia and Africa. The only Australian species is one of the Asiatic ones. The species are probably all parasitical.

1. **S. trifida**, *Hamill.*; *Benth. in DC. Prod.* x. 522. An erect rigid scabrous slightly branched annual of 1 to 3 ft. Leaves narrow linear, the lower ones on the main stem often 3-fid, the upper ones and those of the side branches entire, $\frac{1}{2}$ to 1 in. long with smaller ones often clustered in the axils, the upper ones alternate. Flowers usually distant, forming a very loose terminal leafy raceme. Pedicels at first short, at length $\frac{1}{2}$ in. long. Bracteoles linear, close under the calyx. Calyx 2 to 2½ lines long, with triangular acute lobes as long as the tube, woolly inside. Corolla with a very short tube, almost rotate, about $\frac{1}{2}$ in. diameter, yellow with a purple centre or all purple. Capsule truncate, as long as the calyx.

Queensland? In Leichhardt's collection without the precise station (*Herb. F. Mueller*). The species has a wide range in the hilly districts of India, extending to Ceylon and (in a slight variety) to Madagascar.

25. CENTRANTHERA, R. Br.

Calyx compressed, obliquely acute, split down the lower edge, entire or 2- to 5-toothed at the top. Corolla with a curved tube dilated upwards, the limb spreading, with 5 broad lobes nearly equal or obscurely 2-lipped. Stamens 4, included in the tube; anthers in pair, the cells transverse, with an awn-like point at the end, one cell usually smaller than the other or empty. Style with a lanceolate flattened stigma and. Capsule obtuse, opening loculicidally in 2 entire valves. Seeds minute, testa loose, reticulate; albumen scanty.—Scabrous herbs. Leaves opposite or the upper ones alternate. Flowers almost sessile, axillary or in interrupted terminal spikes with small bracteoles.

The genus consists of a few tropical Asiatic species, including the only Australian one. They are probably several of them if not all parasites.

1. **C. hispida**, *R. Br. Prod.* 135. A stiff erect annual, simple or with spreading branches, 6 in. to 1 ft. high or rarely more, very scabrous with minute hairs or tubercles. Leaves mostly linear, entire, the longer ones 1 to 1½ in. long, the upper ones much smaller. Flowers nearly sessile in the upper axils, alternate and distant. Calyx herbaceous, 3 to 4 lines long. Corolla $\frac{3}{4}$ to 1 in. long, variously said to be pink purple or yellow. One cell of each anther much narrower than the other, with a long point. Capsule ovoid-globose.—*Wall. Pl. As. Rar.* t. 45; *Benth. in DC. Prod.* x. 525.

N. Australia. Alluvial flats near Fish river, Glenelg district, N.W. coast, *Marten*; Victoria river and moist grassy flats, Arnhem's Land, *F. Mueller*.

Queensland. Endeavour river, *Banks and Solander*; Brisbane river, Moreton Bay *W. Hill*; Rockhampton and Rockingham Bay, *Dallachy*.

N. S. Wales. Richmond river, *Beckler*.

The species is widely distributed over tropical Asia, from Ceylon and the Peninsula to the Archipelago and northward to the Himalaya and S. China.

26. **BUCHNERA**, Linn.

Calyx tubular, obscurely nerved, shortly 5-toothed. Corolla-tube slender, straight or slightly curved, the limb with 5 almost equal obovate or oblong spreading lobes, the 2 upper ones inside in the bud. Stamens 4, in pairs, included in the tube; anthers 1-celled, vertical. Style club-shaped at the top, entire. Capsule straight, not acuminate, opening loculicidally in 2 entire valves.—Stiff erect herbs, usually drying black. Lower leaves opposite, the upper ones alternate. Flowers sessile, forming terminal dense or interrupted spikes, with a pair of bracteoles under the calyx.

The genus is widely dispersed over the tropical and subtropical regions of Asia, Africa, and America. The limits of the species are exceedingly difficult to determine, and the Australian ones may be considered either as all endemic or nearly so, or all except *B. tetragona* may be referred as varieties to a single species common in tropical Asia and Africa and very near to a common American one.

- Flowers in short dense 4-sided spikes, the imbricate bracts very broad and as long as the calyx 1. *B. tetragona*.
 Flowers in slender interrupted spikes, the bracts either narrow or much shorter than the calyx.
 Radical and lower leaves broad, rosulate; upper ones narrow, acute. Corolla glabrous 2. *B. urticifolia*.
 Leaves all narrow, the lower ones oblong, the upper ones linear, mostly acute. Corolla glabrous.
 Corolla-tube 3 to 4 lines long 3. *B. linearis*.
 Corolla-tube not 2 lines long 4. *B. tenella*.
 Leaves all narrow and obtuse, usually hoary, the lower ones oblong.
 Stems simple. Corolla glabrous outside 5. *B. gracilis*.
 Stems branching. Corolla pubescent or hispid outside . . . 6. *B. ramosissima*.

1. *B. tetragona*, R. Br. *Prod.* 437. Erect tall and stout, some specimens simple and fully 2 ft. high, others smaller and branched, and all quite glabrous. Lower leaves ovate or oblong, obtuse, coarsely and irregularly sinuate-toothed, narrowed into a short broad petiole and sometimes 3 to 4 in. long, upper ones lanceolate and sometimes all under 2 in. Spikes usually 3 to 5 together, almost sessile within the last pair of leaves, very thick and $1\frac{1}{2}$ to 2 in. long, the flowers densely imbricate in 4 rows, each one sessile within a bract 2 to 3 lines long, much broader than long, very shortly acuminate in the middle. Bracteoles narrow, complicated, acuminate, as long as the calyx. Calyx $2\frac{1}{2}$ lines long, not at all or scarcely compressed, the lobes narrow, very acute, nearly as long as the tube. Corolla-tube slender, nearly 4 lines long, the lobes broad, nearly equal, spreading to 3 or 4 lines diameter. Capsule oblong, rather longer than the calyx.—Benth. in DC. *Prod.* x. 495.

N. Australia. Port Essington, *Armstrong*.

Queensland. Endeavour river, *Banks and Solander*.

Allied to the E. Indian *B. tetraeticha*, but readily distinguished by the smoothness of the whole plant as well as by the calyxes and bracts.

2. *B. urticifolia*, R. Br. *Prod.* 437. Scabrous-pubescent or nearly glabrous. Stems erect and simple or branching and slightly decumbent at the base, rather slender, often above 1 ft. high. Radical and lower leaves almost rosulate at the base of the stem, obovate or broadly oblong, usually

sessile, obtuse, entire or slightly sinuate-toothed, 1 to $1\frac{1}{2}$ or rarely 2 in. long; stem-leaves narrower, the upper ones linear or linear-lanceolate, acute. Flowers purplish or nearly white, in slender interrupted terminal spikes. Bracts mostly ovate, acute, ciliate, about half as long as the calyx or the lower ones longer and narrower: bracteoles similar, but smaller. Calyx narrow, rarely 2 lines long, the teeth acute. Corolla glabrous outside, the tube slender, not twice as long as the calyx. Capsule oblong, obtuse, either equal to or rather exceeding the calyx.—Benth. in DC. Prod. x. 496; Eudl. Iconogr. t. 78.

N. Australia. Victoria river, *F. Mueller*; Glenelg district, N.W. coast, *Marten*.

Queensland. Common along the coast, *R. Brown* and others; from Cape York, *Daemel*, to Moreton Bay, *F. Mueller*.

The common E. Indian *B. hispida* differs chiefly in being much more hirsute. The African *B. leptotachya* can scarcely be distinguished from some forms of the species, which might indeed include, as slight varieties, the following four.

3. ***B. linearis***, *R. Br. Prod.* 437. Scabrous-pubescent. Stems erect, simple or slightly branched, often exceeding 1 ft., the upper leaves linear and acute as in *B. urticifolia*, and sometimes the lower ones scarcely broader, but usually those near the base of the stem are oblong, obtuse, often obscurely toothed, narrowed into a petiole and not sessile nor rosulate. Flowers and fruit the same as in *B. urticifolia*, or rather larger.—Benth. in DC. Prod. x. 497.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; S. Goulburn Island, *A. Cunningham*; Port Essington, *Arndström*; Victoria river and near Macadam Range, *F. Mueller*; King's Ponds, in the interior, *M'Donall Stuart's Expedition*.

Var. *asperata*. *B. asperata*, *R. Br. Prod.* 438; Benth. in DC. Prod. x. 496, appears to be a rather larger, coarser, and more scabrous form of the same species.

Queensland. Bustard Bay and Bay of Inlets, *Banks and Solander*.

4. ***B. tenella***, *R. Br. Prod.* 437. More slender than the other species, simple or branched, often 1 ft. high or more, the foliage and lower part of the plant sparingly hirsute, the upper part often quite glabrous. Leaves all narrow and mostly narrow-linear and acute. Flowers "yellowish-brown," smaller than in *B. linearis* and *B. urticifolia*, but otherwise similar, the corolla glabrous outside, the tube not 2 lines long.—Benth. in DC. Prod. x. 497.

N. Australia. South Goulburn Island, *A. Cunningham*; head of Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Endeavour river, *Banks and Solander*; Facing Island, *R. Brown*.

5. ***B. gracilis***, *R. Br. Prod.* 437. Very near *B. ramosissima*, with the same somewhat hoary indumentum and narrow obtuse leaves, but the stem slender, erect, usually simple or branching at the base only, and the corolla-tube glabrous outside or very rarely sprinkled with a few hairs at the top of the tube.—Benth. in DC. Prod. x. 497.

N. S. Wales. Port Jackson, *R. Brown*. The only specimens hitherto detected so far south.

6. ***B. ramosissima***, *R. Br. Prod.* 438. Erect or decumbent at the base, more branching than the other species and usually more hoary with a short scabrous pubescence, sometimes under 6 in. but often attaining 1 ft. or

more. Lower leaves oblong, obtuse, narrowed into a short petiole, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long; upper ones linear but almost always obtuse, and all usually quite entire. Bracts and bracteoles usually narrow and short. Calyx 2 to 3 lines long, with acute teeth. Corolla-tube more or less exserted, always pubescent or hispid outside, especially at the top, the lobes narrow, about $1\frac{1}{2}$ lines long. Capsule about as long as the calyx.—Benth. in DC. Prod. x. 496.

N. Australia. Hunter's River, York Sound, N.W. coast, *A. Cunningham* (a large variety, attaining 2 ft. or more).

Queensland. Thirsty Sound, *R. Brown*; Port Denison, *Fitzalan*; Graeme and near Rockhampton, *Bowman*.

Var. ? *parviflora*. Corolla much smaller, slightly pubescent outside.—*B. pubescens*, Benth. in DC. Prod. x. 496.—Endeavour river, *A. Cunningham*.

27. STRIGA, Lour.

Calyx tubular-campanulate, with prominent nerves, 5-toothed or 5-lobed. Corolla-tube slender, abruptly bent at or above the middle, the limb 2-lipped, the upper lip emarginate or 2-lobed, innermost in the bud, the lower 3-lobed. Stamens 4, in pairs, included in the tube; anthers vertical, 1-celled. Style club-shaped at the top, entire. Capsule straight, not acuminate, opening loculicidally in 2 valves. —Rigid erect annuals, usually scabrous and drying black. Lower leaves opposite, upper ones alternate, sometimes, in species not Australian, all reduced to small scales. Flowers sessile, usually forming terminal interrupted spikes.

A genus of several species, dispersed over the tropical regions of the Old World, and all probably parasites on roots. Of the four Australian species, one is a common one in tropical Asia; the other three, closely allied to each other, may be all endemic. The characters by which several of the species are distinguished, those especially which are derived from the size and proportions of the corolla, are very difficult to observe correctly in dried specimens, and appear often to be very variable.

Calyx with 10 equally prominent ribs 1. *S. hirsuta*.

Calyx with 5 prominent ribs, smooth between them or rarely here and there an obscure vein.

Corolla scarcely $\frac{1}{4}$ in. long, the upper lip more than half as long as the lower 2. *S. parviflora*.

Corolla above $\frac{1}{2}$ in. long, the upper lip more than half as long as the lower 3. *S. multiflora*.

Corolla nearly or fully $\frac{3}{4}$ in. long, the upper lip less than half as long as the lower 4. *S. corviflora*.

1. ***S. hirsuta***, Benth. in DC. Prod. x. 502. An erect, scabrous or pubescent, simple or slightly branched annual, usually about 6 in. high, and not always drying so black as the other species. Leaves linear or the lower ones lanceolate. Flowers yellow red or white, in terminal interrupted spikes, the lower ones distant. Calyx variable in size, usually 2 to $2\frac{1}{2}$ lines long, with 10 very prominent scabrous or hispid nerves, one of them very rarely here and there divided, the furrows between them very narrow. Corolla-tube glabrous, $\frac{1}{4}$ to $\frac{1}{2}$ lines long, bent near the top; the upper lip much shorter than the lower one.—*Campuleia coccinea*, Hook. Exot. Fl. t. 203.

Queensland. Backlin River, *Bowman*. Frequent in tropical Asia, extending westward into Africa, eastward to the Archipelago, and northward to S. China.

2. ***S. parviflora***, Benth. in Coop. Bot. May. and in DC. Prod. x. 501.

A very scabrous, erect, simple or slightly branched annual of 6 to 9 in. Leaves linear, usually short, the floral ones very narrow. Flowers small (blue ?), in more or less interrupted terminal spikes. Calyx 1 to $1\frac{1}{2}$ lines long, with 5 very scabrous and prominent ribs, and smooth between them or here and there with an imperfect row of minute prickles. Corolla scarcely 3 lines long, the tube bent near the top, the lobes all very short, but the upper lip more than half as long as the lower one. Capsule broad. — *Buchnera parviflora*, R. Br. Prod. 438.

Queensland. Keppel Bay, *R. Brown*; Peak Range, *Leichardt*; Broad Sound, Sutor and Bowen rivers, Nercool Creek, Gracemere, *Bowman*.

3. ***S. multiflora***, *Benth. in Comp. Bot. Mag. and in DC. Prod.* x. 501. Nearly allied to *S. parviflora* and to *S. curviflora*, and in some respects intermediate between the two, with a similar calyx but different corolla. Stems erect and usually branched, often above 1 ft. high. Leaves linear, often above 1 in. long, the floral ones small and narrow. Flowers usually numerous (blue or purple ?). Corolla glabrous glandular or pubescent, intermediate in size between those of *S. parviflora* and *S. curviflora*, but in some specimens fully as large as in the latter, the upper lip shortly and broadly 2-lobed, more than half as long as the lower lip.

N. Australia. Victoria river and Sturt's Creek, *F. Mueller*; on all the islands to the westward of Goulburn island, *A. Cunningham*; Port Essington, *Arctstrong*; Camden Harbour, Glenelg district, N.W. coast, *Marten* (with remarkably large flowers).

I have now some doubts whether the Philippine Island and Moheca plant I referred to this species in the 'Prodromus' be really the same.

4. ***S. curviflora***, *Benth. in Comp. Bot. Mag. and in DC. Prod.* x. 501. Usually a much taller and stouter plant than *S. parviflora*, many of the specimens above 1 ft. high, simple and slightly branched and very scabrous. Leaves linear, the lower ones above 1 in. high. Flowers (blue or purple ?) in terminal interrupted spikes. Calyx 3 lines long or more, with long subulate-acuminate teeth, the tube with 5 prominent scabrous ribs, and smooth between them. Corolla pubescent, the tube 4 to 5 lines long, bent near the top, the lobes of the lower lip 3 to 4 lines long, the upper lip slightly notched, only 1 to $1\frac{1}{2}$ lines long, usually somewhat recurved. — *Buchnera curviflora*, R. Br. Prod. 438.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; N.W. coast, *Pycnos*.

Queensland. Endeavour river, *Banks and Solander*; Rockhampton, *O'Shane*; Cape York, *Daemel*.

28. RHAMPHICARPA, Benth.

Calyx campanulate, 5-lobed. Corolla-tube long and slender, straight or slightly curved; lobes 5, obovate, nearly equal or the 2 upper (inside in the bud) rather smaller. Stamens 4, in pairs; anthers 1-celled, vertical, obtuse. Capsule ovate, compressed or turgid, acuminate, with a straight or oblique beak, opening loculicidally in 2 valves. — Erect branching glabrous herbs, drying black and perhaps parasitical. Lower leaves opposite, upper ones alternate, entire or the lower ones pinnately divided. Flowers in terminal racemes, usually without bracteoles.

A small genus, chiefly African, with one Asiatic species, the same as the Australian one.

1. ***R. longiflora***, Benth. in *Comp. Bot. Mag. and in DC. Prod.* x. 504. An erect slender but rigid branching annual, more or less scabrous, from under 6 in. to nearly 1 ft. high. Leaves pinnately divided into linear-subulate segments, rather short and distant, or sometimes again toothed or pinnate, the whole leaf usually above 1 in. long. Flowers in the upper axils, on pedicels of $\frac{1}{2}$ to 1 in., without bracteoles. Calyx broadly campanulate, 2 to 3 lines long, the lobes ending in fine points. Corolla-tube slender, about 1 in. long when perfect, with a campanulate throat, the lobes broad, varying in size, but always 2 or 3 times shorter than the tube. Capsule ovate, acuminate, without prominent margins, the beak nearly straight or somewhat oblique in the Australian form.—*R. fistulosa*, Benth. in DC. Prod. x. 504.

N. Australia, *F. Mueller* (imperfect specimens in Herb. Hook.); *Det. 17' 58'*, *M. Donald Stuart's Expedition* (imperfect specimens in Herb. F. Muell.) These Australian specimens seem to connect the African *R. fistulosa*, which has usually the capsule bordered by a raised nerve or wing, but the beak straight, with the Asiatic *R. longiflora* (Wight, l. c. f. 1415), which has not the raised nerve, but the beak of the capsule more or less oblique or recurved. Neither character appears, however, to be quite constant, and the foliage and flowers are the same in all.

29. **HEMIARRHENA**, Benth.

Calyx deeply divided into narrow obtuse segments. Corolla tubular at the base, the throat dilated, the upper lip erect, narrow, concave, entire, the lower one longer, spreading, divided into 3 narrow lobes folded over the upper lip in the bud. Stamens 2, without any rudiment of the upper pair; filaments arched; anthers connivent under the upper lip but free, each with one pendulous cell, with a fine rigid point or awn at the end, opening longitudinally from the base to near the end. Style filiform, slightly dilated at the end, entire. Capsule ovoid, opening in 2 entire thin valves, parallel to the thin dissepiment. Seeds numerous, striate and reticulate, like those of *Gratiolæ*.—Slender perennial. Leaves opposite rosulate or clustered at the base of the stem. Flowers in short terminal racemes, without bracteoles.

The genus is limited to a single species endemic in Australia, and singularly exceptional in whichever of the great suborders it is placed. The form and aestivation of the corolla and aristate anthers, so decidedly those of Euphrasieæ, are absolutely unknown in Antirrhinoideæ, whilst the capsule and seeds, exactly those of Lindernieæ, are as foreign to any of the genera hitherto known in Euphrasieæ, or indeed in any but a very doubtful one of the whole suborder of Rhinanthideæ.

1. ***H. plantaginea***, Benth. Stems from a thick perennial almost woody stem, erect, very slender, simple, often above 1 ft. long, quite glabrous. Leaves in few pairs at the base of the stem, almost rosulate, very shortly petiolate, ovate or broadly oblong, obtuse, entire, glabrous, $\frac{1}{2}$ to 1 in. long, and sometimes 1 or 2 pairs of minute scale-like sessile leaves higher up the stem. Flowers densely crowded in a short oblong terminal raceme, with sometimes a branch proceeding from the base bearing a second raceme. Pedicels very short, glandular-pubescent, in the axils of minute bracts. Calyx-segments above 1 line long, membranous, with a dark-coloured midrib and a few large glands on each side. Corolla-tube slender, about 3 lines long, the throat dilated, the upper lip scarcely above 1 line long, the lobes of the lip longer,

the whole corolla of a delicate texture and veined like that of *Euphrasia*. Capsule obtuse, not exceeding the calyx.—*Pandellia plantaginæa*, F. Muell. in Trans. Vict. Inst. iii. 62; *Lindernia plantaginæa*, F. Muell. Fragm. vi. 102.

N. Australia. Mount King, Glen Ig district, N.W. coast, *Marten*; between Providence Hill and McAdam Range, *F. Mueller*; Arnhem's Land, *McDonall Stuart's Expedition*.

30. EUPHRASIA, Linn.

Calyx tubular or campanulate, 4-lobed. Corolla tubular at the base, 2-lipped, the upper lip concave or hood-shaped, with 2 broad spreading lobes; the lower lip spreading, 3-lobed, overlapping the upper ones in the bud. Stamens 4 in pairs; anthers 2-celled, connivent under the upper lip of the corolla, the cells mucronate, often hairy. Style slightly dilated at the end, the stigma obtuse, entire or with a small upper lobe. Capsule oblong, compressed, opening loculicidally in 2 valves. Seeds oblong, striate. Herbs either annual or perennial and branching at the base, believed to be often partially parasitical on roots. Leaves opposite, toothed or lobed. Flowers sessile or nearly so in short and dense or long and interrupted terminal spikes, the floral leaves or bracts usually more acute than the stem-leaves. Bracteoles none. Anther-cells equal in all the Australian species, unequal in some others.

The genus comprises a small number of very variable species distributed over the temperate and colder regions of the northern hemisphere, extratropical South America, and New Zealand. Of the eight Australian forms here admitted as species, one is also in New Zealand and Fuegia, another is very near a New Zealand one, and the remainder appear to be endemic, but some of them are scarcely more than marked varieties.

Perennials, branching at the base with ascending or erect stems.

Leaves ovate or broadly oblong, very pubescent and rugose. Flowers very large. Stems tall 1. *E. speciosa*.

Leaves narrow, pubescent or glabrous. Flowers variable in size, the spikes usually interrupted 2. *E. collina*.

Lower leaves small obovate or broadly cuneate. Flowers usually in compact spikes. Alpine species.

Anthers very hairy. Stems usually 4 to 8 in. 3. *E. alpina*.

Anthers glabrous or shortly hairy along the suture. Stems usually 2 to 3 in. 4. *E. striata*.

Pubescent erect annuals (usually above 6 in.), not drying so black as the perennials, and the corolla-lobes not so broad. Anthers very hairy.

Flowers yellow. Teeth of the upper leaves rather acute 5. *E. scabra*.

Flowers white or purplish. Teeth of the upper leaves very acute 6. *E. arguta*.

Dwarf annuals (under 4 in.). Anthers glabrous or minutely or very sparingly ciliate.

Glabrous or nearly so. Leaves digitately 4- to 8-lobed, the lobes acute or cuspidate 7. *E. cuspidata*.

Glandular-pubescent. Leaves pinnatifid or 3-lobed, the lobes obtuse. 8. *E. antarctica*.

1. ***E. speciosa***, *R. Br. Prod.* 437. Stems stout, erect or ascending, often exceeding 1 ft., very scabrous-pubescent as well as the foliage. Leaves sessile, ovate or broadly oblong, obtusely and coarsely toothed, undulate and very rugose, 4 to 8 lines long, the floral ones broad and deeply crenate. Flowering spike at first dense, afterwards interrupted, the flowers large.

Calyx 2 to 3 lines long, pubescent, the lobes broad, dilated and very obtuse or rarely almost acute. Corolla pubescent, the tube much dilated upwards, the lower lip large and broad with the middle lobe notched.

N. S. Wales. Port Jackson, *R. Brown*.

Victoria. Forest Creek, *P. Mueller*.

P. Mueller may be right in considering this as a remarkably large-flowered variety of the following species, and certainly there are some of the more pubescent and vigorous specimens of the variety *paludosa*, which come near to the *E. speciosa*, and which in the 'Prodrômus' I had referred to that species. But *Brown's* specimens show larger flowers than any others, except those above-quoted from *P. Mueller*, with broader more sessile and much more rugose leaves.

2. ***E. collina***, *R. Br. Prod.* 436. Stems from a hard usually if not always perennial much-branched base, ascending or erect, from 6 in. to above 1 ft. high, glabrous or pubescent as well as the foliage, the inflorescence usually more or less glandular-pubescent. Leaves sessile or the lower ones narrowed into a short petiole, from oblong to linear-cuneate, obtuse and obtusely toothed at the end only or more frequently to near the base, usually $\frac{1}{2}$ to $\frac{1}{2}$ in. long, but larger in luxuriant specimens; the floral ones smaller broader and less toothed, the upper ones often entire (rarely cuneate and more deeply toothed?). Flowers purple bluish or white, sometimes mixed with yellow, rarely quite yellow, in terminal spikes, usually long and interrupted, with the flowers in distant pairs, at least when the flowering is advanced, rarely compact but occasionally remaining so even in fruit. Calyx usually about 2 lines long at first and lengthening to 3 lines, but very variable, the lobes acute or obtuse, equal to or shorter than the tube. Corolla-tube exerted, the throat broad, the lobes large but scarcely so long as the tube, the middle lower one emarginate, the others very obtuse or retuse, the whole corolla varying from $\frac{1}{2}$ to $\frac{3}{4}$ in. in length. Anthers hirsute. Capsule exceeding the calyx, shortly mucronate or rather acute.—*Benth.* in *DC. Prod.* x. 553; *Hook. f. Fl. Tasn.* i. 296; *E. tetragona*, *R. Br. Prod.* 436; *Benth.* l. c.; *Bartl.* in *Pl. Preiss.* i. 343; *E. multicaulis*, *Benth.* l. c.; *Hook. f. Fl. Tasn.* i. 297.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 183, 507, and many others; northward to Hastings river, *Beckler*; and New England, *C. Stuart*; southward to Twofold Bay, *P. Mueller*; westward to the Lachlan, *A. Cunningham* and others (all chiefly the var. *paludosa* and other large forms).

Victoria. Abundant from the Glenelg to Gapps' Land, Wimmera, and the Grampians, ascending to 4500 ft., *P. Mueller* and others.

Tasmania. Derwent river, *R. Brown*; common on dry hilly situations as well as in marshy ground, *J. D. Hooker*.

S. Australia. Memory Cove, *R. Brown*; around St. Vincent's and Spencer's Gulfs, *P. Mueller* and others; and (large varieties approaching *E. speciosa*) Mount Rous, *Wilhelm*; Flinders and Lofly Ranges, *P. Mueller*.

W. Australia. King George's Sound, *R. Brown* and others, *Preiss.* n. 2338, and eastward to Cape le Grand and Esperance Bay, *Maxwell*.

Var. *paludosa*. Tall and often pubescent. Leaves nearly of *E. speciosa*, but much narrower. Flowers usually distant in long interrupted spikes, purple white or sometimes yellow (*R. Brown*, *Woolfs*).—*E. paludosa*, *R. Br. Prod.* 436.—In marshes chiefly in N. S. Wales, but including a few of the larger Victorian and S. Australian specimens.

The preceding *E. speciosa* and the following *E. alpina*, and even *E. striata*, are not separated from *E. collina* by any very marked characters, and *P. Mueller* (*Fragm.* v. 88)

unites them all under the name of *E. Brownii*. It does not appear necessary, however, to disregard Brown's names *E. collina* or *E. speciosa*, either of which might, without inconvenience, be applied to the collective species. This has the appearance of being generally, if not always, perennial, but probably not of long duration, and sometimes evidently flowering the first year, but its mode of growth requires further observation of the living plant. *E. tetragona*, Br., from King George's Sound, is certainly one of the common forms of *E. collina*, the stems are but very obscurely angular or compressed in the original typical specimens. *E. multicaulis*, Benth., appears to be the typical *E. collina*, Br. The whole series are closely allied to the New Zealand *E. cuneata*, Forst.

3. ***E. alpina***, *R. Br. Prod.* 436. A perennial, branching at the base, with the habit of the smaller specimens of *E. collina*, usually glabrous or very minutely pubescent, the stems ascending to 6 to 8 in. or rarely taller. Leaves obovate to oblong-cuneate, narrowed at the base, very obtuse, with few very obtuse teeth, rather thick, 2 to 3 lines long or the upper narrower ones in luxuriant specimens 4 to 5 lines long. Flowers rather large, white or bluish purple with darker streaks, usually in short compact spikes, rarely more distant in interrupted spikes, the floral leaves or bracts broadly cuneate and crenate. Anthers very hairy.—Benth. in DC. *Prod.* x. 553; Hook. f. *Fl. Tasm.* i. 296 (partly); *E. diemenica*, Spreng. *Syst.* ii. 777.

N. S. Wales. Mount Kosciusko, near the Victorian frontier, *F. Mueller*.

Victoria. Summits of the Cobberas and Munyong mountains, *F. Mueller*.

Tasmania. Mount Wellington, *R. Brown, Gunn*, and others, Western Mountains, *Gunn, C. Stuart*.

This may be an alpine form of *E. collina*, differing from the glabrous varieties of that species in its short broad lower leaves, the inflorescence usually more compact with broader more cuneate floral leaves. The variety *humilis* of the 'Prodrômus' is *E. striata*; the var. *angustifolia* must be reduced to *E. collina*.

4. ***E. striata***, *R. Br. Prod.* 436. A perennial branching at the base, with the habit of *E. alpina*, but smaller, the ascending or erect flowering stems usually only 2 or 3 in. high and very rarely exceeding 6 in., glabrous except two decurrent lines of pubescence, and the inflorescence sometimes glandular-pubescent. Leaves small, obovate or oblong, crenate-toothed, the floral ones cuneate, usually broad and toothed or almost digitate at the end. Flowers in short compact spikes, usually white or pale coloured streaked with red or purple. Anthers either quite glabrous or shortly or sparingly hairy along the line of dehiscence.—Benth. in DC. *Prod.* x. 554; Hook. f. *Fl. Tasm.* i. 297; *E. alpina*, var. *humilis*, Benth. l. c. 553.

Victoria. Summits of the Baw-Baw, Cobberas, and Munyong mountains, *F. Mueller*.

Tasmania. Summit of Mount Wellington, *R. Brown, A. Cunningham*, and others; Western Mountains, *Archer*; Birch's Inlet, Macquarie harbour, *Millican*; South Port, *C. Stuart*.

5. ***E. scabra***, *R. Br. Prod.* 437. An erect, rigid, simple or branched annual of $\frac{1}{2}$ to 1 ft., scabrous-pubescent and not drying so black as *E. collina* and its allies. Leaves oblong-lanceolate, with a few teeth more prominent and less obtuse than in *E. collina*, and the upper ones often acute, the stem-leaves rarely above $\frac{1}{2}$ in. long, the floral ones narrow and more entire, the uppermost linear. Flowers yellow and scarcely or not at all streaked, in terminal spikes at first dense but at length often long and interrupted. Calyx narrow, glandular-pubescent, the lobes almost acute. Corolla-tube ex-

ceeding the calyx and dilated at the top, but not so much so as in *E. collina*, and the lobes very much shorter and entire, the whole corolla usually about $\frac{1}{2}$ in. long. Anthers very hairy.—Benth. in DC. Prod. x. 554; Hook. f. Fl. Tasm. i. 297; Bartl. in Pl. Preiss. i. 343.

N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham*, *Sieber*, n. 490, *Woolfs*; grassy lands north of Bathurst, *A. Cunningham*; New England, *C. Stuart*; Mount Mitchell, *Beckler*.

Victoria. Glenelg river, *Robertson*, *Allitt*; Port Phillip, *Gunn*; thence to the lower part of the Australian Alps, *F. Mueller*; Upper Murray river, *Bull*; Creswick, *Whan*.

Tasmania. Port Dalrymple, *R. Brown*, abundant about Circular Head, *Gunn*; Cheshunt, *Archer*.

S. Australia. Around St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. King George's Sound and adjoining districts, *Drommond*, n. 14, 244, *Preiss*, n. 2337, *Oldfield*, *F. Mueller*; eastward to Esperance Bay and Cape Knobb, *Macwell*.

6. *E. arguta*, *R. Br. Prod.* 437. An erect branching annual of $\frac{1}{2}$ to $1\frac{1}{2}$ ft., pubescent like *E. scabra*, but not usually so scabrous. Leaves oblong-lanceolate, usually deeply toothed, the lower ones like those of *E. scabra*, the upper ones with more acute often numerous teeth or lobes, and the floral ones usually but not always with long subulate points to the lobes. Flowers in long spikes at length interrupted, very near those of *E. scabra*, but the corolla, with a bluish tint when dry, is described (by *R. Brown* and *A. Cunningham*) as white with a yellowish throat, and the throat is rather broader and the lobes rather larger than in *E. scabra*, though less so than in *E. collina*, the lobes entire as in *E. scabra*.

N. S. Wales. Paterson's and Williams' rivers, *R. Brown*, plains near Bathurst, *A. Cunningham*, New England, *Leichhardt*; Mudgee, *Woolfs*.

Victoria. Plains of the Cobberas Mountains, *F. Mueller*.

This species is certainly very closely allied to *E. scabra*, although the specimens I had when describing for the 'Prodromus,' and upon which I united the two species, have proved not to have been correctly identified with Brown's plant.

7. *E. cuspidata*, *Hook. f. Fl. Tasm.* i. 298. An erect simple or scarcely branched annual, glabrous or rarely with slightly pubescent stems, drying very black, 2 to 4 in. high. Leaves broadly cuneate, digitately divided to near the middle into 4 to 8 acute or cuspidate flat lobes, the floral ones usually broader with as many or even more lobes or teeth. Flowers in short dense leafy spikes, shortly exceeding the floral leaves. Calyx 3 to 4 lines long in flower, 5 lines when in fruit, glandular-pubescent, the lobes acute, rather shorter than the tube. Corolla-tube scarcely so long as the calyx, the lobes of the lower lip emarginate, as long as the tube. Anthers very minutely ciliate along the line of dehiscence of the cells or quite glabrous. Capsule oval-oblong, shorter than the calyx, obtuse or slightly notched. Seeds not numerous, the loose testa forming a wing round them.

Tasmania. Mount Sorrell, Macquarrie harbour, *Milligan*; Western Mountains, *Archer*; Mount Lapeyrouse, *Oldfield*, *C. Stuart*.

8. *E. antarctica*, *Benth. in DC. Prod.* x. 555. An erect or diffuse branching glandular-pubescent annual, 1 to 2 in. or rarely 3 in. high. Leaves oblong, obtuse, pinnatifid, narrowed at the base or almost petiolate, $\frac{1}{4}$ to $\frac{1}{2}$

in. long, the floral ones mostly 3-fid only. Flowers in the uppermost axils, sometimes not exceeding the floral leaves, sometimes nearly twice as long. Calyx 2 to nearly 3 lines long, the lobes obtuse, shorter than the tube. Corolla-tube about as long as the calyx, the lower lip as long as the tube, the lobes emarginate. Anthers either quite glabrous or very sparingly hirsute along the line of dehiscence of the cells. Capsule oval-oblong, as long as the calyx, slightly notched. Seeds few.—*E. alsa*, F. Muell. in Trans. Phil. Soc. Vict. i. 107, and in Hook. Kew Journ. viii. 203.

Victoria. Wet gravelly places on the summits of the Mayong Mountains, at an elevation of 6000 ft., *F. Mueller*.

The species is also in New Zealand, Pucgia, and S. Chili. As in New Zealand, some of the dwarf specimens of $\frac{1}{2}$ to 1 in. have the flowers, and especially the calyces, much smaller.

ORDER LXXXIV. LENTIBULARIÆ.

Calyx free, with 2 to 5 segments lobes or teeth. Corolla irregular, the tube usually projecting into a spur or pouch at the base, the limb 2-lipped. Stamens 2, included in the tube and inserted at its base. Anthers 1-celled. Ovary superior, 1-celled, with several ovules attached to a free central placenta. Style short, with a 2-lipped stigma. Fruit a capsule. Seeds small, often minute, the testa usually reticulate, without albumen. Embryo with very short cotyledons or apparently undivided.—Herbs either aquatic or growing in marshes or wet places. Leaves radical or floating or none. Flowers solitary or several in a raceme, on leafless radical or terminal scapes or peduncles.

The Order, comprising but very few genera, is dispersed over the greater part of the globe. Of the two Australian genera, one, the principal one of the Order, occupies its whole area, the other, dismembered from it by a purely artificial character, is endemic.

Calyx of 2 opposite segments 1. UTRICULARIA.
Calyx of 4 segments in pairs, the inner ones lateral 2. POLYPOMPHOLYX.

1. UTRICULARIA, Linn.

Calyx deeply divided into 2 lobes or segments. Corolla with a spur at the base rarely reduced to a small protuberance, the mouth of the tube usually closed or nearly so by a convex palate, the upper lip erect, broad, entire, sinuate or 2-lobed, the lower usually longer and broader, entire or 3-lobed (rarely 2-lobed or 1-lobed by the suppression or division of the middle lobe), with the lobes reflexed or the whole lip spreading horizontally, with a convex palate at the base, often bearing a small 3-lobed protuberance. Capsule globular, opening in 2 valves.—Herbs either floating with submerged root-like leaves divided into capillary segments and interspersed with little vesicles or bladders full of air, or marsh plants either leafless or with entire radical leaves. Peduncles or scapes radical or axillary. Flowers solitary or in a raceme, alternate or opposite, with a small scale-like bract under each pedicel and sometimes 1 or very few similar minute scales on the scape below the flowers. Bracteoles in many species 2 at the base of the pedicels, but very minute and often concealed within the bract.

A considerable genus, dispersed over nearly the whole globe except the extreme north and south, and especially numerous within the tropics both in the New and the Old World, several species having a very wide range. Of the 20 Australian species, five are the same as tropical Asiatic ones; another extends to New Zealand; the remaining 14 appear to be endemic; but one or two of the minute ones require further comparison from better specimens with Indian species. The corollas, from which some of the chief specific characters are drawn, are indeed of so delicate a nature that it is exceedingly difficult to ascertain their precise form in dried specimens; and it is to be feared that, in several of the following descriptions, slight inaccuracies may have crept in, which will have to be corrected chiefly from the examination of living plants.

§ 1. **Natantes**.—*Stems floating. Leaves submerged, divided into capillary segments, mostly interspersed with bladders. Flowers yellow, on axillary peduncles.*

Peduncles bearing about the middle a cluster or false whorl of oblong or linear vesicles 1. *U. stellaris*.

Peduncles without vesicles.

Pedicels thickened and reflexed after flowering. Corolla rather large.

Style about 1 line long 2. *U. flexuosa*.

Peduncles filiform, pedicels slender and erect in fruit. Corolla small.

Stigma almost sessile. Seeds winged 3. *U. exoleta*.

§ 2. **Limosæ**.—*Plants growing in mud (sometimes under water) with erect leafless scapes. Leaves radical, often accompanied by filaments of which some bear utricles, or no leaves at all at the time of flowering.*

Bracts not produced below their insertion, always alternate.

Flowers yellow or white, 1 or 2 on short filiform scapes.

Corolla (white) upper lip emarginate, lower shortly and broadly 3-lobed 4. *U. albiflora*.

Corolla (yellow?) upper lip entire, lower with 1 broad lobe and 2 lateral narrow ones 5. *U. pygmæa*.

Flowers yellow, several in a raceme.

Pedicels very short, erect in fruit, not winged.

Spur horizontal. Palate spotted with red 6. *U. fulva*.

Spur descending 7. *U. chrysantha*.

Pedicels as long as the calyx, reflexed, and more or less winged in fruit. Spur descending 8. *U. bifida*.

Flowers blue or white, several in a raceme. Pedicels short, not winged. Calyx-segments rather acute 9. *U. cyanea*.

Flowers small, purple. Calyx-segments very obtuse.

Flowers distant, on very short pedicels. Scapes 1 to 4 in. 10. *U. lateriflora*.

Flowers solitary. Scapes about 1 in.

Corolla upper lip broad. Spur as long as the lower lip 11. *U. simplex*.

Corolla upper lip narrow. Spur half as long as the lower lip 12. *U. monanthos*.

Bracts produced below their insertion into a small free appendage.

Flowers purple (or deep blue?).

Pedicels opposite, in 1, 2 or 3 pairs or in whorls of three. Corolla lower lip large, semicircular.

Scapes erect, slender. Eastern species 13. *U. dichotoma*.

Scapes twining. Western species 14. *U. volubilis*.

Scapes 1-flowered. Bracts opposite or in whorls of three.

Spur shorter than the large semicircular lower lip.

Upper lip entire or shortly 2-lobed. Eastern species 13. *U. dichotoma*.

Upper lip deeply 2-lobed. Western species 15. *U. Hookeri*.

Spur longer than the lower lip.

Flowers under $\frac{1}{2}$ in. long. Lower lip shortly 3-lobed 16. *U. violacea*.

Flowers $\frac{1}{2}$ to 1 in. long. Lower lip deeply 3-lobed 17. *U. Menziesii*.

Flowers racemose, alternate as well as the bracts. (Flowers blue?).

Pedicels as long as or longer than the calyx. Lower lip 2-lobed.

Flowers $\frac{1}{2}$ in. long or more. Spur longer than the lower lip . 18. *U. biloba*.

Flower scarcely 2 lines long. Spur shorter than the lower lip . 19. *U. limosa*.

Pedicels scarcely any, Lower lip entire 20. *U. Baueri*.

U. barbata, R. Br. Prod. 432; A. DC. Prod. viii. 16, from Queensland, *Banks and Solander*, is unknown to me. There is no specimen in the Banksian or in Brown's herbarium that I can identify with it, nor indeed any in which I can discover the palate to be hairy or bearded as described.

U. compressa, R. Br. Prod. 431; A. DC. Prod. viii. 15, from Queensland, *Banks and Solander*, cannot now be identified. The character given will apply to several species, and no specimen is preserved either in the Banksian or in Brown's herbarium.

§ 1. *Stems floating. Leaves submerged, divided into capillary segments.*

1. **U. stellaris**, *Linn. f.*; A. DC. Prod. viii. 3. Stems floating, branched, extending to a considerable length. Submerged leaves root-like, branching into numerous capillary segments interspersed with little globular vesicles. Peduncles slender, 2 to 4 in. long in the Australian specimens but longer in some Indian ones, bearing at some distance below the raceme a cluster or almost a whorl of 3 to 5 oblong or narrow vesicles each about $\frac{1}{2}$ in. long, tapering at both ends, and bearing a few short simple or branched capillary segments. Flowers several, yellow, on pedicels of 2 to 6 lines, which are slender at the time of flowering, often thickened under the fruit, and then spreading or reflexed. Calyx-segments ovate and about 1 line long in flower, broad and 2 lines diameter in fruit. Corolla upper lip ovate or rounded, obtuse, longer than the calyx, lower lip nearly orbicular, scarcely longer than the upper one, truncate or slightly 3-toothed; spur turned upwards under the lower lip and about its length. Capsule nearly as long as the calyx, membranous. Seeds peltate, with an angular margin.—*Oliv. in Journ. Linn. Soc. iii. 174*; F. Muell. Fragm. vi. 161; Wight, Ic. t. 1567 (not good).

N. Australia. Nicholson, Robinson, and Gilbert rivers, Gulf of Carpentaria, *F. Mueller*. Common in tropical Asia, extending also into tropical Africa.

2. **U. flexuosa**, *Fahl.*; *Oliv. in Journ. Linn. Soc. iii. 175*. Submerged floating stems extending sometimes to several feet. Leaves all submerged and root-like, branching into numerous capillary segments, interspersed with little globular vesicles or utricles. Peduncles usually 3 to 6 in. long, without vesicles, bearing a raceme of 3 to 6 yellow flowers. Pedicels erect and slender at the time of flowering, usually reflexed and thickened upwards when in fruit. Calyx-segments rather unequal, enlarged when in fruit. Corolla fully 5 lines across, the upper lip ovate, entire or slightly emarginate, the lower nearly reniform, the palate marked with brown veins; spur obtuse, shorter than the lower lip. Style about 1 line long. Capsule nearly 3 lines diameter.—*U. fasciculata*, *Roxb.*; Wight, Ic. t. 1568; A. DC. Prod. viii. 7; *U. australis*, R. Br. Prod. 430; A. DC. Prod. viii. 6; *Lehm. Pl. Preiss. i. 338*; *Hook. f. Fl. Tasm. i. 298*; F. Muell. Fragm. vi. 161.

N. Australia. Robinson river, Gulf of Carpentaria and near Providence Hill, *F. Mueller*.

Queensland. Barnett and Brisbane rivers, *F. Mueller*; Midge Creek and Burdekin river, *Bowman*; near Rockhampton, *O'Shanesy*.

N. S. Wales. Paramatta, *R. Brown*.

Victoria. Lagoons on the Yarra, Goulburn river, and near Omeo, *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; pools near the S. Esk river, near Launceston, *Gunn*.

W. Australia. Avon river, *Preiss*, n. 1875. These, as well as some of the specimens from the other colonies, are without flower, and therefore in some measure doubtful; but those from Omeo, as well as Brown's and several of the northern ones, are in flower or fruit, and agree perfectly with those from tropical Asia, where the species has a wide range.

3. ***U. exoleta*, R. Br. Prod. 430.** Nearly allied to *U. flexuosa*, but very much smaller and more slender. Floating submerged stems capillary, with exceedingly fine filiform leaves, not much divided, interspersed with minute vesicles, the largest of which are scarcely $\frac{1}{2}$ line diameter, and in marshy places the linear-filiform leaves are nearly entire. Scapes filiform, 1 to 3 in. long or rarely more, bearing 1, 2 or 3 small yellow flowers. Bracts very obtuse, not produced below their insertion. Pedicels slender and erect in fruit as well as in flower. Calyx-segments broad, very obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ line long in flower, slightly enlarged under the fruit but not exceeding the capsule. Corolla not above 3 lines long to the end of the spur and sometimes scarcely 2 lines, the lips nearly equal, both broad; spur narrow-conical, obtuse, horizontal or turned upwards, as long as or longer than the lower lip. Stigma sessile. Capsule membranous. Seeds peltate, bordered by a thin irregular wing.—*A. DC. Prod. viii. 7*; *F. Muell. Fragm. vi. 162*; *U. diantha*, *Ram. and Schult.*; *Oliv. in Journ. Linn. Soc. iii. 176*, not of *A. DC.*; *Wight, l. t. 1569*.

N. Australia. Victoria river and swamps near sea range, *F. Mueller*.

Queensland. Gracemere, *Bowman*; near Rockhampton, *O'Shanesy*.

N. S. Wales. Nepean river, *R. Brown*.

The species has a wide range in tropical Asia.

§ 2. *Scapes erect. Leaves radical or none.*

4. ***U. albiflora*, R. Br. Prod. 431.** Scapes filiform, $\frac{1}{2}$ to 1 in. long, bearing a single small white flower. Leaves none at the time of flowering. Bract minute, not produced at the base. Pedicel very short. Calyx-segments $\frac{1}{2}$ line long at the time of flowering, $\frac{3}{4}$ line when in fruit. Corolla not 2 lines long, the upper lip small, emarginate, lower lip broad, shortly 3-lobed; spur descending, as long as the lower lip.—*A. DC. Prod. viii. 15*.

Queensland. Endeavour river, *Banks and Solander*. Perhaps a white-flowered variety of *U. pygmæa*, but both of these minute species require further investigation from better specimens.

5. ***U. pygmæa*, R. Br. ? Prod. 432.** Scapes filiform, 1 to 3 in. high. Leaves radical, narrow-linear or none. Flowers small, yellow, solitary or 2 distant ones on rather long filiform pedicels. Bracts obtuse, not produced at the base. Calyx-segments obtuse, about 1 line long. Corolla: upper lip not twice as long as the calyx, obovate or orbicular, entire; lower lip larger, the middle lobe convex, fully 2 lines across, "the lateral lobes linear, divaricate;" spur ascending, as long as the lower lip. Capsule membranous, the fruiting pedicel not reflexed.—*A. DC. Prod. viii. 16*.

Queensland. Cape Grafton, *Banks and Solander*; Brisbane river, *W. Hill*.

The Banksian specimens are minute, and the colour of the flower is not given; their identity with Hill's yellow-flowered specimens (determined by *F. Mueller*) is therefore in some measure uncertain.

6. **U. fulva**, *F. Muell. in. Trans. Phil. Inst. Viet.* iii. 63. Scapes simple or slightly branched, $\frac{1}{2}$ to 1 ft. high, more rigid than in *U. chrysantha*, the flowering portion flexuose. Radical leaves none at the time of flowering. Flowers yellow, rather distant, often numerous, almost sessile or the pedicel rarely 1 line long and erect in fruit. Bracts very obtuse, not produced at the base. Calyx-segments obtuse, above 1 line long. Corolla: upper lip 2 or 3 times as long as the calyx, broad and broadly 2-lobed; lower lip very broad, obscurely 3-lobed, the very convex palate spotted with red; spur rather slender, horizontal or ascending, nearly or quite as long as the lower lip. Capsule about 1 line diameter, slightly crustaceous. Seeds very small, ovoid.

N. Australia. Around stagnant waters near Macadan Range, *F. Mueller*: Strangways river, *M'Douall Stuart*.

7. **U. chrysantha**, *R. Br. Prod.* 432. Scapes slender but tall, often exceeding 1 ft. Leaves usually none at the time of flowering. Flowers yellow, usually numerous but distant, rarely forming a more compact spike. Pedicels exceedingly short, erect in fruit and then not exceeding 1 line. Bracts very small, usually acute, not produced at the base. Calyx-segments ovate-lanceolate, about 1 line long. Corolla: upper lip much longer than the calyx, ovate-orbicular, entire; lower lip rather longer, broad, very convex, the margins reflexed and 4-lobed (3-lobed with the middle lobe 2-fid): spur descending, straight or slightly curved, as long as the upper lip, the whole corolla usually about $\frac{1}{2}$ in. long. Capsule globular, almost crustaceous, about 1 line diameter. Seeds minute.—**A. DC. Prod.** viii. 18.

N. Australia. Regent river, Brunswick Bay, N.W. coast, *J. Cunningham*; Glenelg river, N.W. coast, *Marten*; Victoria river, *F. Mueller*; Port Essington, *Armstrong*.

Queensland. Point Lookout, *Banks and Salmader*; Rockingham Bay, *Dallachy*.

U. flava, *R. Br. Prod.* 432; **A. DC. Prod.** viii. 18, from Endeavour river, *Banks and Salmader*, appears to me to be a slender variety of *U. chrysantha*, with the middle lobe of the lower lip nearly entire.

8. **U. bifida**, *Lam. ; Oliv. in Joura. Linn. Soc.* iii. 182. Scapes slender, usually about 6 in. high. Radical leaves small, linear or spatulate, very rare at the time of flowering. Flowers yellow, usually from 6 to 8 on the scape, rather distant. Pedicels 1 to 2 lines long, reflexed when in fruit and winged by the decurrent calyx-segments. Bracts acute, not produced at the base. Calyx-segments orbicular, obtuse, scarcely above 1 line long in flower, twice as large and decurrent when in fruit. Corolla: upper lip obovate, longer than the calyx, the lower lip broad, convex, longer than the upper one; spur conical, descending, as long as the upper lip. Capsule membranous. Seeds small, ovoid, reticulate.—*U. diantha*, **A. DC. Prod.** viii. 21, not of *Rœm.* and *Schult.*

Queensland. Rockingham Bay, *Dallachy*. Extends over tropical Asia.

9. **U. cyanea**, *R. Br. Prod.* 431. Scapes slender, rarely exceeding 6 in. Leaves radical, linear or slightly spatulate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, or sometimes very narrow and more than twice that length, but usually disappearing before the flowering. Flowers blue, sometimes very pale or white, several on the scape but distant. Pedicels shorter than or scarcely exceeding the

calyx, ascending or erect in fruit and not at all or scarcely winged. Bracts acute or acuminate, not produced at the base. Calyx-segments about 2 lines long when in flower and scarcely enlarged in fruit, acute or scarcely obtuse. Corolla: upper lip shorter than the calyx or scarcely exceeding it, obovate; lower lip rather longer, broader and very convex; spur descending, conical, rather obtuse, as long as the lower lip. Capsule membranous. Seeds nearly globular, appearing tuberculate or almost muricate when dry, reticulate only when soaked.—A. DC. Prod. viii. 15; *U. graninifolia*, R. Br. Prod. 432, but scarcely of Vahl.

N. Australia. Fitzmaurice river, *F. Mueller*.

Queensland. Endeavour river, *Banks and Solander*; Brisbane river, *F. Mueller* (with leaves 1 in. long).

N. S. Wales. Grose river, *R. Brown*; Manly Beach swamp, *Woolfs*.

Var. *alba*. Corolla white, the calyx not quite so large in proportion at the time of flowering.—Rockingham Bay, *Dallachy*.

U. affinis, Wight, Ic. t. 1580; Oliv. in Journ. Linn. Soc. iii. 178, from the Indian Peninsula, appears to be, as suggested by Oliver, the same plant, differing from the common Asiatic *U. caradon*, Linn. (which is probably the true *U. graninifolia*, Vahl.) in the shorter pedicels, usually less acute calyxes, and perhaps a few other characters of no great importance.

10. ***U. lateriflora***, R. Br. Prod. 431. Scapes slender, sometimes filiform, but often rather rigid and drying black, 1 to 4 in. high. Leaves radical, spatulate, very rarely present at the time of flowering. Flowers small, purple, usually only 2 to 4, distant and very shortly pedicellate or almost sessile. Bracts obtuse, not produced at the base. Calyx not 1 line long. Corolla: upper lip oblong or linear, truncate or emarginate, shortly exceeding the calyx; lower lip broader than long, 3 to 4 lines across, entire or obscurely crenate, the sides reflexed; spur conical, nearly as long as the lower lip or sometimes rather longer. Capsule membranous. Seeds small, ovoid.—A. DC. Prod. viii. 15; Hook. f. Fl. Tasm. i. 299.

N. S. Wales. Near Sydney, frequent, *R. Brown*.

Tasmania. King's Island, *R. Brown*; Rocky Cape and near Franklin river, *Gunn*; lagoons, Brisbane Bay, Macquarie Harbour, *Mollison*; Western Mountains, *Archer*; South Port, *C. Stuart*.

U. parviflora, R. Br. Prod. 431; A. DC. Prod. viii. 15, appears to me to be a slight variety of *U. lateriflora*, with long filiform scapes and rather smaller flowers.

11. ***U. simplex***, R. Br. Prod. 431. Scapes filiform, about 1 in. long in the specimens seen, simple and 1-flowered. Leaves radical, linear-cuneate, very few or none at the time of flowering. Bract not produced at the base. Pedicel short. Calyx-segments broad, obtuse, about $\frac{3}{4}$ line long. Corolla: upper lip broadly obovate or rounded, the lower larger, broader than long, 3 to 4 lines across, entire or obscurely crenate, the sides reflexed; spur ascending, flattened, about as long as the lower lip.—A. DC. Prod. viii. 15.

W. Australia. Moist heaths, King George's Sound, *R. Brown*; swamps at the base of Mount Melville, *F. Mueller*.

12. ***U. monanthos***, Hook. f. Fl. Tasm. i. 299. A little plant, closely resembling *U. simplex*, with the same filiform, simple, 1-flowered scapes of

about 1 in., and bracts and calyx the same, but the upper lip of the corolla very narrowly obovate, emarginate, much shorter than the broad, semicircular, scarcely notched lower lip, and the spur not above half as long as the lower lip.

Tasmania. Wet sandy ground near Arthur's Lakes, *Gunn*. Also in New Zealand. United by F. Mueller (*Fragn.* vi. 162) with *U. simplex*, but probably without actual comparison of specimens.

13. ***U. dichotoma***, *Labill. Pl. Nov. Holl.* i. 11. t. 8. Scapes slender, from a few inches to above 1 ft. high. Leaves radical, petiolate, from almost ovate and 1 line long to linear or oblong, 3 to 4 lines long (or in a few abnormal specimens more than 1 in. and very narrow), accompanied by filiform fibres, some of them bearing small fringed utricles, the leaves sometimes disappearing before the flowering. Flowers purple or lilac, opposite in 1 or 2 pairs or whorls of 3 at the end of the stem, rarely reduced to a single terminal flower. Pedicels filiform, at first very short but lengthening to from $\frac{1}{4}$ to $\frac{1}{2}$ in. under the fruit. Bracts always opposite or in threes (even when the flower is solitary), small and narrow, very shortly produced below their insertion. Calyx-segments usually about $1\frac{1}{2}$ lines long, broad and obtuse. Corolla: upper lip small, broadly ovate or obovate, obtuse or obscurely 2-lobed; lower lip horizontal, broadly semicircular, $\frac{1}{2}$ to $\frac{3}{4}$ in. across, the palate with a small 3-lobed prominence; spur descending, obtuse, much shorter than the lower lip and sometimes very short. Capsule membranous. Seeds small, ovoid.—A. DC. *Prod.* viii. 14; Hook. f. *Fl. Tasm.* i. 299; F. Muell. *Fragn.* vi. 161; *U. speciosa*, R. Br. *Prod.* 430; *U. oppositiflora*, R. Br. l. c.; A. DC. *Prod.* viii. 14.

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart*; near Goulburn, *Woolle*.

Victoria. Wendu Vale, *Robertson*; Port Phillip, near Brighton, Station Park, *Grammians*, etc., *F. Mueller*; Skipton, *Whun*.

Tasmania. In pools and wet soil, abundant, ascending to 3500 ft., *J. D. Hooker*.

Var. *uniflora*. Flowers smaller, mostly solitary.—*U. uniflora*, R. Br. *Prod.* 431; A. DC. *Prod.* viii. 14; Hook. f. *Fl. Tasm.* i. 299. Generally mixed with the 2- or more-flowered specimens, but chiefly in N. S. Wales. The specimens distinguished by Brown as his three species appear to me to differ only in the number and size of the flowers, which are always variable in all the sets of *U. dichotoma* which I have seen.

14. ***U. volubilis***, *R. Br. Prod.* 130. Scapes rather slender, twining sometimes to the length of 3 ft. or more, with a radical tuft of filaments, some of them bearing rather large utricles (often 2 lines diameter), but no leaves seen. Flowers large, purple, opposite in one or two pairs or rarely reduced to a single terminal flower. Pedicels $\frac{1}{2}$ to 1 in. Bracts opposite, narrow, produced below their insertion into an appendage sometimes nearly as long as the upper part. Calyx-segments thin, coloured, very obtuse, nearly 2 lines long. Corolla: upper lip scarcely twice as long as the calyx, broadly obovate or almost orbicular, retuse; lower lip horizontal, semicircular, entire, $\frac{3}{4}$ to 1 in. across, the palate yellowish, with a small 3-lobed protuberance at its base; spur descending, short and very obtuse. A. DC. *Prod.* viii. 14; *Lehm. Pl. Preiss.* i. 339; F. Muell. *Fragn.* vi. 160.

W. Australia. Swamps, King George's Sound and adjoining districts, *R. Brown*; *Preiss.* ii. 1922, *F. Mueller*.

15. **U. Hookeri**, *Lehm. Nov. Stirp. Pug.* viii. 47, and *Pl. Preiss.* i. 339. Scapes slender, 3 to 5 in. high, bearing a single terminal purple flower. Leaves linear, often $\frac{1}{2}$ in. long, not expanded into an obtuse lamina, but acute though flat, accompanied by filiform fibres, some of them bearing small utricles. Bracts opposite or 3 in a whorl, shortly produced below their insertion. Pedicel 2 to 4 lines long. Calyx-segments ovate, obtuse, coloured, about $1\frac{1}{2}$ lines long, usually unequal. Corolla: upper lip much contracted at the base, deeply divided into 2 oblong diverging lobes about 2 lines long; lower lip almost reniform, entire or broadly 3-lobed, $\frac{1}{2}$ to $\frac{3}{4}$ in. across, the palate with a small 3- or 5-lobed protuberance at the base; spur obtuse, shorter than the lower lip. Capsule membranous.—*U. inequalis*, A. DC. *Prod.* viii. 666; *U. linearifolia*, Benj. in *Linnaea*, xx. 306 (partly); *U. latilabiala*, Benj. l. c. 315.

W. Australia. Swan River, *Drummond*, n. 128, 508, *Preiss.* n. 1918; Tone and Vasse rivers, *Oldfield*.

Benjamin has, in the Hookerian herbarium, named some specimens *U. latilabiala*, others *U. uniflora* and *U. linearifolia*; his character of the latter is a compound of two or three species, but appears to have been taken chiefly from Drummond's specimens n. 508 of *U. Hookeri*.

U. similis, *Lehm. Nov. Stirp. Pug.* viii. 46, and *Pl. Preiss.* i. 339, and *U. Preissii*, A. DC. *Prod.* viii. 666, are both founded on Preiss's specimens n. 1919, from Swan River, which I have not seen. From the descriptions of the two authors (which do not quite agree with each other) the species only appears to differ from *U. Hookeri* in the lower lip of the corolla more deeply 3-lobed, a character in which *U. Hookeri* and the allied species are variable. Neither author describes the bracts as produced below their insertion, but Lehmann states them to be opposite, which, as far as known, only occurs in the groups of *U. dichotoma*, where they are always more or less produced. A. DC. describes a single 3-fid bract,—a mistake arising probably from the 3 whorled bracts being so closely packed as to appear united.

16. **U. violacea**, *R. Br. Prod.* 431. Scapes filiform, 1 to 2 in. high, bearing a single small terminal purple flower. Leaves linear or slightly spatulate, rarely almost ovate, obtuse, very small, often accompanied by filaments, a few of them bearing small utricles. Bracts opposite, oblong, obtuse, produced below their insertion. Pedicel short. Calyx-segments very obtuse, rather unequal, about $\frac{3}{4}$ line long in flower, often $1\frac{1}{2}$ lines in fruit. Corolla not 3 lines long to the end of the spur; upper lip shortly exceeding the calyx, obtuse, more or less but usually very shortly 2- or 3-lobed or almost entire; lower lip twice as long as the upper lip, broader than long, crenately 3-lobed; spur conical, horizontal, nearly twice as long as the lower lip. Capsule membranous. Seeds minute.—A. DC. *Prod.* viii. 15; *U. perminuta*, F. Muell. *Fragm.* vi. 160.

W. Australia, *Drummond*, n. 86 and 213; King George's Sound, *R. Brown*; Mount Melville, near King George's Sound, *F. Mueller*. Drummond's specimens in the Hookerian herbarium were confounded by Benjamin with *Polypnaphotys tacella*, which resembles it in size, but is very readily distinguished by the bracts and calyx.

17. **U. Menziesii**, *R. Br. Prod.* 431. Scapes filiform, 1 to 2 in. high, bearing a single large terminal purple flower, remarkable for its long spur. Leaves linear-spatulate, 1 to 2 lines long, on long petioles, more abundant at the time of flowering than in most species, accompanied by numerous transparent filaments, a few of which bear small utricles. Bracts opposite or

in whorls of three, linear-oblong, shortly produced below their insertion. Pedicel 2 to 4 lines long. Calyx-segments obtuse, coloured, nearly 2 lines long. Corolla: upper lip cuneate or obovate, retuse, not twice as long as the calyx and reflexed over it; lower lip larger, broad, entire or crenate, about 4 lines across; spur somewhat curved, very obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in. long.—A. DC. Prod. viii. 15; Lehm. Pl. Preiss. i. 339; *U. macroceras*, A. DC. Prod. viii. 666.

W. Australia. King George's Sound, *Mezies*, and thence to Swan River, *Drummond*, 1st Coll., *Preiss*, n. 1917, *Harvey*, *Oldfield*.

18. **U. biloba**, *R. Br. Prod.* 432. Scapes slender, simple or slightly branched, 6 to 9 in. high, usually with several small scales, which as well as the bracts are alternate and produced below their insertion, mostly acute. Leaves very small and rare at the time of flowering. Flowers blue (*R. Brown*), dark when dry, several in a raceme, on filiform pedicels usually as long as or rather longer than the calyx. Calyx-segments about 1 line long when in flower and but slightly enlarged afterwards, very broad and obtuse. Corolla: upper lip very short, ovate, 2-lobed, with the sides reflexed; lower lip broader than long, broadly 2-lobed; spur conical, obtuse, horizontal or descending, longer than the lower lip, the whole corolla 3 or 4 lines long.—A. DC. Prod. viii. 24.

N. S. Wales. Port Jackson, *R. Brown*, *Backhouse*. This and the following two species usually turn black in drying, which is not the case with *U. cyanea*. *U. lateriflora* sometimes turns black, but it is readily distinguished by the bracts.

19. **U. limosa**, *R. Br. Prod.* 432. Scapes filiform, simple or branched, 6 to 10 in. high. Leaves none at the time of flowering. Flowers (blue?) in a long loose raceme, all alternate. Bracts narrow, much produced below their insertion, acute at both ends. Pedicels filiform, 1 to 2 lines long. Calyx-segments orbicular, obtuse, about $\frac{1}{2}$ line long when in flower, slightly enlarged afterwards. Corolla scarcely above 2 lines long, the upper lip short, ovate, entire; lower lip much larger, broad, deeply 2-lobed; spur descending, shorter than the lower lip. Capsule small.—A. DC. Prod. viii. 24.

Queensland. Endeavour river, *Banks and Solander*. Very near *U. biloba*, but very much more slender, the flowers much smaller, the pedicels longer, and the spur shorter.

20. **U. Baueri**, *R. Br. ? Prod.* 431. Scapes slender but rather long, simple or slightly branched, more rigid than in *U. biloba*, bearing usually several scales below the inflorescences, which, like the bracts, are all alternate, narrow, produced below their insertion, acuminate and very acute at both ends. Flowers (blue?) almost sessile in short terminal spikes, with rarely the lower flower at some distance below the spike. Calyx-segments obtuse, small. Corolla: upper lip short, narrow-ovate, erect, entire; lower lip much larger (about 3 lines across), broader than long, apparently quite entire with the sides reflexed; spur straight, horizontal, considerably longer than the lower lip.—A. DC. Prod. viii. 15.

Queensland. Endeavour river, *Banks*; Shoalwater Bay, *R. Brown*.

N. S. Wales. Port Jackson, *Bauer*?

U. Baueri was described by Brown from a drawing made by Bauer of a plant of which no specimen was preserved; but in his notes he says he believes it to be the same as one of which he had a specimen before him, which there is now no certain means of identifying.

The character, however, agrees well with the specimens described above, which are named by Solander in the Banksian herbarium *U. juncea*, and with one in Brown's own herbarium labelled *U. obscura*, neither of which names are taken up by Brown.

2. POLYPOMPHOLYX, Lehm.

(*Tetralobus*, A. DC.)

Characters and habit of *Utricularia*, except that the calyx, besides the two fore-and-aft segments of that genus, has two additional inner lateral segments alternating with them.—Marsh plants with radical leaves, leafless scapes and racemose or solitary pink flowers, the bracts alternate and not produced at the base.

The genus is limited to the two W. Australian species.

Scapes several inches to above 1 ft. high. Flowers rather large, the spur not half as long as the lower lip 1. *P. multifida*.
Scapes usually under 3 in. Flowers small, the spur usually as long as the lower lip 2. *P. tenella*.

1. ***P. multifida***, *F. Muell. Fragm.* vi. 162. Scapes sometimes filiform, under 6 in. high, bearing only 2 or even a single pink flower, sometimes stouter, above 1 ft. high, with a loose raceme of 5 or 6 flowers. Leaves radical, linear-spathulate, accompanied by filiform fibres, some of them bearing utricles, but often all disappearing before the flowering. Bracts minute, obtuse. Pedicels usually distant, filiform, varying in length, erect or spreading in fruit. Calyx, outer segments rather unequal broad and obtuse, a little more than 1 line long in flower, more or less enlarged in fruit; inner ones similar but considerably shorter. Corolla: upper lip scarcely exceeding the calyx, deeply divided into 2 narrow usually acuminate lobes; lower lip large (from under $\frac{1}{2}$ in. to fully $\frac{3}{4}$ in. across according to the size of the flower), more or less deeply divided into 3 obtuse retuse or bifid lobes, the palate marked with a small digitately 5-lobed protuberance; spur obtuse, not half so long as the lower lip. Capsule membranous. Seeds very numerous, pel-tate. *Utricularia multifida*, R. Br. Prod. 132; A. DC. Prod. viii. 18; Benth. in Hueg. Enum. 82; *U. latiloba*, Benth. l. c.; *Polypompholyx Endlicheri*, Lehm. Nov. Stirp. Pug. viii. 48, and Pl. Preiss. i. 340; *P. latiloba*, Lehm. ll. cc. 49 and 341; *Tetralobus Preissii*, A. DC. Prod. viii. 667.

W. Australia. King George's Sound and adjoining districts, *Menzies*, R. Brown, *Preiss.* n. 1921, and many others: Vasse and Tone rivers, *Otdfield*; Swan River, *Huegel*, *Drummond*, n. 509 (also 507 in Herb. Hook., but probably a mistake), *Preiss.* n. 1923 (the latter specimen not seen).

The specimens in the Hookerian Herbarium are variously named by Benjamin, *P. latiloba*, Lehm., *U. uniflora*, Br., *U. oppositiflora*, Br., and *U. linearifolia*, Benj.

2. ***P. tenella***, *Lehm. Nov. Stirp. Pug.* viii. 50, and *Pl. Preiss.* i. 341. Closely allied to *P. multifida*, differing chiefly in its small size and longer spur. Scapes filiform, 1 to 2 or rarely 3 in. high, bearing 1 or 2 small pink flowers. Calyx as in *P. multifida*, but smaller. Corolla with the short upper lip deeply divided into acuminate lobes and the lower with 3 retuse lobes, as in that species, but scarcely 3 lines across, and the spur usually as





Polypompholyx exigua, H. M. del. & lit.

long as the lower lip.—Hook. f. Fl. Tasm. i. 300; *Utricularia trailla*, R. Br. Prod. 132; A. DC. Prod. viii. 16; *Tetralix pusillax*, A. DC. Prod. viii. 667; *P. exigua*, F. Muell. in Trans. Phil. Soc. Viet. i. 50, in Hook. Kew Journ. viii. 203, and Lithogr. t. 64.

Victoria. Near Melbourne, *Atkinson*; mossy, peaty, or boggy places in the Gram-
pious, Serra and Victoria ranges, *F. Mueller*.

Tasmania. Flinders Island, *Gunn*.

S. Australia. Echunga, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*; summit of Mount Melville, *F. Mueller*; Swan River, *Preiss*, n. 1920 (not seen), *Drummond*, n. 85, 507.

ORDER LXXXV. OROBANCHACEÆ.

Flowers irregular. Sepals 4 or 5, united in a variously split calyx. Corolla tubular or campanulate, usually curved or oblique; the limb more or less 2-lipped; the upper lip erect or spreading, emarginate or 2-lobed; the lower lip spreading, 3-lobed. Stamens 4, in pairs, inserted in the tube. Anthers 2-celled, the cells usually but not always pointed or awned, opening longitudinally. Ovary superior, 1-celled, with 2 (very rarely 3) double or bifid placentas, or 4 distinct placentas, more or less protruding from the sides into the cavity, but not united in the axis. Ovules several, usually very numerous. Style simple, with a capitate or 2-lobed stigma. Capsule 2-valved. Seeds small, with a minute embryo and abundant albumen.—Leafless herbs, not green, parasites on roots. Stems usually thick, the leaves replaced by alternate scales or bracts of the colour of the rest of the plant. Flowers solitary in the axils of the bracts, usually forming terminal spikes or racemes.

An Order not very numerous in species, but widely distributed over nearly the whole globe, except the extreme north and south, and much more abundant in the northern than in the southern hemisphere. The only Australian genus is the principal one of the Order, though almost limited to the northern hemisphere.

1. OROBANCHE, Linn.

Calyx divided to the base on the upper side, and often also on the lower side, so as to form 2 lateral sepals, either entire or 2-cleft, either distinct from each other or more or less connected at the base on the lower side, and sometimes connected also on the upper side by the intervention of a small fifth lobe, and always pointed. Habit and other characters those of the Order.

The principal genus of the Order, abundant in the northern hemisphere in the Old World, less so in North America, and a very few of the European species have also appeared in the southern hemisphere, and amongst them the only Australian one.

1. *O. cernua*, *Loefl.*; *Reed. in DC. Prod.* xi. 32. Stems stout, erect, simple, from about 6 in. to above 1 ft. high, of a pale brown colour more or less tinged with blue and loosely pubescent: the scales ovate, the lower ones ovate, the upper ones acute or acuminate. Flowers of a lurid bluish purple, pale or whitish towards the base, in a rather dense spike, occupying about

one-third of the stem. Bracts acuminate, acute, shorter than the corolla. Sepals in the Australian specimens 2, entire, lanceolate, with long points, nearly as long as the bracts. Corolla tubular, incurved, about $\frac{3}{4}$ in. long, glabrous or minutely glandular-pubescent towards the top; upper lip very concave, with 2 short broad lobes, not ciliate; lower lip divided into 3 ovate shortly acuminate spreading lobes. Filaments glabrous; anthers not mucronate. Style glabrous, with short very thick stigmatic lobes.

Victoria. Black Forest on *Senecio latus*, and Cape Grant, *F. Mueller*; Murray river, *Dallachy*.

S. Australia. Near Cudnaka, *F. Mueller*.

W. Australia. *Draconwood*, n. 185, 198; Swan River, *Oldfield*; Flinders Bay, *Collie*.

The species is an inhabitant of the Mediterranean region of the northern hemisphere, where it is found on several species of *Artemisia*, and extends to E. India. Its introduction into Australia is not easily accounted for.

ORDER LXXXVI. GESNERIACEÆ.

(Cyrtrandrææ, *DC. Prod.*)

Flowers usually irregular. Calyx with 5 tooth lobes or distinct sepals. Corolla with a long or short tube, the limb 2-lipped or of 5 spreading lobes, imbricate in the bud. Stamens 2 or 4, in pairs, inserted in the tube, with the addition sometimes of a fifth barren one or staminodium. Anthers 2-celled or 1-celled by the confluence of the two, the cells opening longitudinally. Ovary superior or more or less inferior, 1-celled, with 2 parietal entire or lobed placentas, protruding more or less into the cavity, but not united in the axis. Ovules numerous. Style simple, with an entire or lobed stigma. Fruit a berry or capsule. Seeds small, numerous, with or without albumen. Embryo straight.—Herbs or rarely shrubs or climbers. Leaves opposite or whorled.

A considerable Order, chiefly tropical, with a very few species from more temperate climates. Of the two Australian genera, one is endemic, the other is Asiatic, extending into China beyond the tropics, and westward to the Seychelles islands. Both belong to the tribe of *Cyrtrandrææ*, characterized by a superior ovary and by the seeds containing little or no albumen. This tribe is limited to the Old World, with the exception of a very few American species, whilst the other two tribes, *Gesneriææ* and *Besleriææ*, are exclusively American. The Order differs from *Scrophulariææ* and *Bigoniaceæ* chiefly in the parietal placentation of the ovary.

Woody climber or epiphyte. Fruit globular, lightly pulpy, indehiscent . . . 1. *FIELDIA*.
Herb with radical leaves. Fruit a spirally twisted linear capsule 2. *BÆA*.

1. *FIELDIA*, A. Cunn.

Calyx divided to the base into 5 segments. Corolla tubular, the limb 5-lobed, somewhat 2-lipped. Stamens 4, didynamous; anther-cells parallel, distinct. Stigma 2-lobed. Fruit slightly pulpy, indehiscent.—Woody climber or epiphyte. Leaves opposite, unequal. Pedicels axillary, 1-flowered, with herbaceous bracteoles under the calyx.

The genus is limited to a single species, endemic in Australia.



1. **F. australis**, *A. Cunn. in Field, N. S. Wales*, 364. t. 2. A tall climbing shrub clinging to the trunks of large trees by adventitious roots, the branches foliage and inflorescence hirsute with articulate hairs. Leaves very unequal in each pair, the larger one obovate elliptical or oblong, coarsely toothed, narrowed into a short petiole, $1\frac{1}{2}$ to 3 in. long; the opposite one sessile, ovate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long or rarely half as long as the larger one. Flowers of a greenish yellow, pendulous from axillary pedicels, shorter than the larger leaf. Bracteoles herbaceous, thin, ovate-lanceolate, acuminate, often $\frac{1}{2}$ in. long. Calyx-segments lanceolate, acuminate, about as long as the bracteoles. Corolla-tube nearly cylindrical or slightly enlarged upwards, above 1 in. long; lobes very short and broad, nearly equal. Stamens inserted near the base of the tube and nearly as long as the corolla, the filaments dilated especially in the lower part; anther-cells obtuse; staminodium between the upper stamens small and slender. Placentas of the ovary 2-lobed, densely covered with exceedingly numerous ovules. Fruit about as long as the calyx, the pericarp membranous. Seeds exceedingly numerous, oblong, minutely striate. Embryo straight, surrounded by scanty albumen.—DC. Prod. ix. 286; Hook. Exot. Fl. t. 232; Bot. Mag. t. 5989; *Basiphyleta Friderici Augusti*, F. Muell. First Gen. Rep. 16.

N. S. Wales. Generally diffused in the moist shady woods of the Blue Mountains, *A. Cunningham* and others; Shoalhaven, *Backhouse*; Illawarra, *A. Cunningham*, *Shepherd*.

Victoria. Sealer's Cove and Strelitzky Range, Gipps' Land, *F. Mueller*.

2. **BÆA**, Commers.

Calyx divided to the base into 5 segments. Corolla with a short broadly campanulate tube, the limb somewhat 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes all flat and spreading. Stamens 2, shorter than the corolla; anther-cells diverging or divaricate, confluent at the apex into a single cell; staminodia usually 3, very small. Stigma 2-lobed. Capsule linear, spirally twisted, splitting usually into 4 valves. Seeds minute.—Herbs with a perennial stock and radical leaves, or in species not Australian a developed stem and opposite leaves. Peduncles or scapes axillary, bearing usually a dichotomous or umbellately branched panicle of flowers, without bracteoles.

The genus comprises a very few Asiatic species, one of them extratropical, and one from the Seychelles Islands. The only Australian one is endemic.

1. **B. hygroscopica**, *F. Muell. Fragm.* iv. 146. A perennial with a short thick woolly stock. Leaves radical, rosulate, broadly ovate or orbicular, crenate, sessile or contracted into a short broad petiole, thick soft and rugose, densely clothed with long woolly hairs, the larger ones 4 to 5 in. long, but usually half that size. Scapes 1 to 3 in. high, bearing a loose umbellately branched panicle of rather numerous deep blue flowers, the inflorescence glabrous or sprinkled with a few hairs. Bracts few and minute. Calyx-segments linear-oblong, about $1\frac{1}{2}$ lines long. Corolla-tube broad and not above 1 line long, upper lip of 2 orbicular lobes about 2 lines diameter, lobes of the lower lip smaller. Filaments thickly clavate, longer than the anthers;

anther-cells quite divaricate, forming a single narrow-oblong cell. Stigma of 2 short broad lobes. Capsule from $\frac{3}{4}$ to above 1 in. long.

Queensland. Rock-cream Bay, *W. Hill, Dallachy*. At first sight closely resembles the N. Chinese *B. hygrometrica*, Br. (*Dorcoceras*, Bunge), which has the same foliage, but the scape in the Chinese plant is less divided, the corolla-tube much larger (that figured in Deless. Ic. v. t. 95, is an imperfectly developed bud), and the anthers reniform on short filaments.

ORDER LXXXVII. BIGNONIACEÆ.

Flowers irregular. Calyx tubular or campanulate, truncate toothed or laterally split. Corolla-tube elongated or rarely short and campanulate; lobes 5, spreading, often arranged in 2 lips, variously imbricate or rarely induplicate-valvate in the bud. Stamens 2 or 4, in pairs, inserted in the tube, the fifth staminodium usually small, rarely wanting. Anthers 2-celled, the cells opening longitudinally. Ovary usually 2-celled, with 2 distinct placentas in each cell attached to the dissepiments, and either contiguous or separated by a considerable interval, or, in some genera not Australian, the dissepiment discontinued between the placentas, and the ovary then 1-celled; ovules several, often numerous to each placenta. Style filiform, with 2 short stigmatic lobes. Fruit a capsule, often elongated, opening loculicidally or septifragally in 2 valves, leaving the dissepiment free. Seeds transverse, usually flattened and bordered by a membranous wing, without albumen. Embryo straight or rarely curved; cotyledons flat or fleshy; radicle next the hilum. —Trees shrubs or woody climbers, very rarely (in species not Australian) herbs. Leaves opposite or rarely scattered, compound or rarely simple, without stipules. Flowers solitary in the axils or more frequently paniculate.

An Order almost entirely tropical, and most abundant in South America, with a few Asiatic and African species. Of the four Australian genera, two extend at least to tropical Asia, another is perhaps a congener of a New Caledonian plant, the fourth appears to be endemic. But the Order is at present in a state of great confusion, and not the less so that it has been partially elaborated by different botanists, who entertain very different views as to the theoretical structure of the ovary. The limits of the genera must therefore remain very uncertain until a satisfactory rearrangement of the whole shall have been laid before us. All the Australian genera belong to De Candolle's second subtribe *Catalpeæ*, in which the dehiscence of the capsule is loculicidal, the dissepiment being transverse, that is, attached (before maturity) to the centres of the valves.

Stamens included in the corolla-tube.

Calyx truncate or slightly toothed. Woody climbers. 1. *TECOMA*.

Calyx spathaceous, split longitudinally. Erect trees 2. *SPATHODEA*.

Stamens exerted, longer than the corolla.

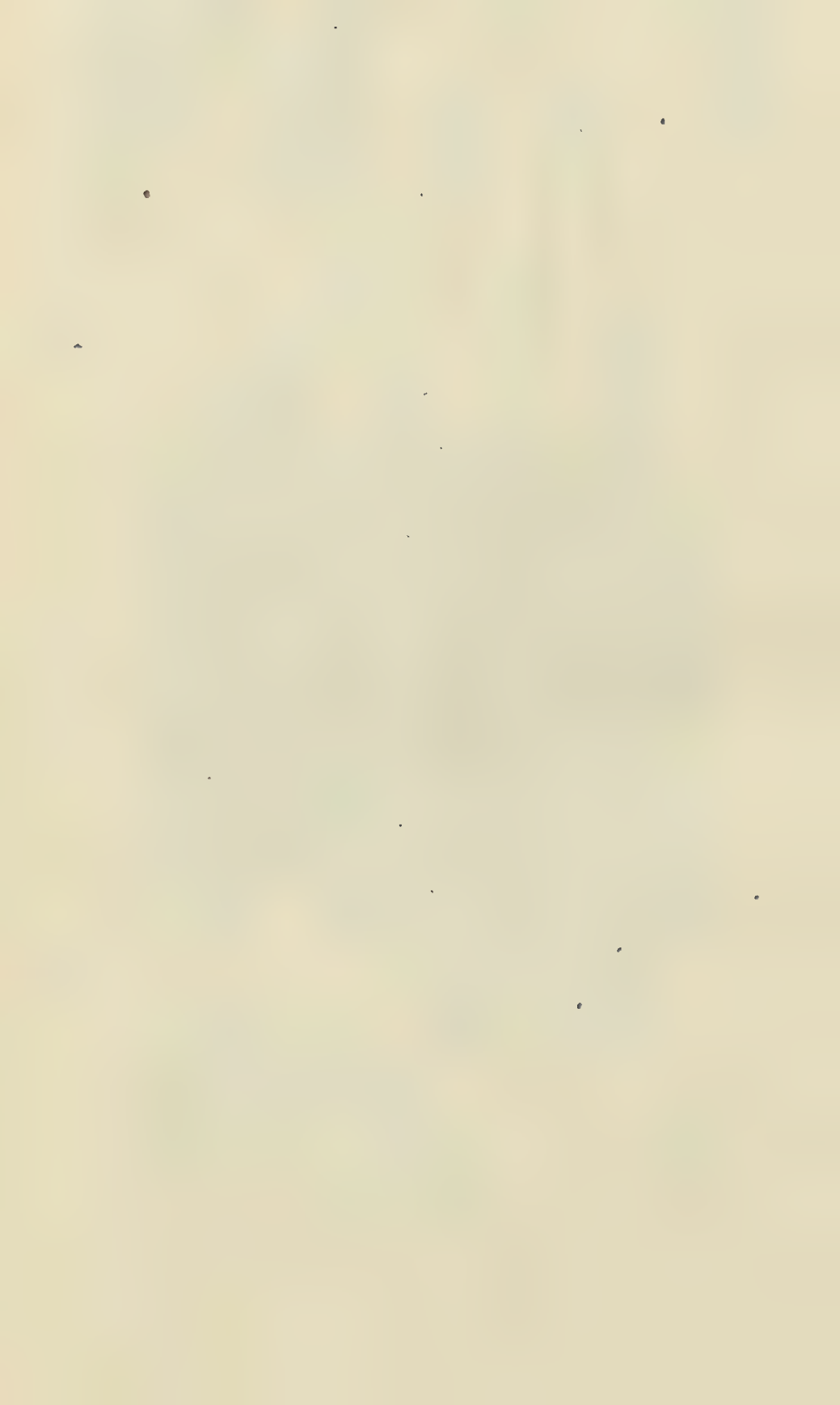
Corolla-tube elongated; lobes induplicate-valvate. Woody climber, with compound leaves 3. *HAUSSMANNIA*.

Corolla-tube campanulate; lobes imbricate. Erect tree, with simple whorled leaves 4. *DIPLANTHERA*.

1. *TECOMA*, Juss.

Calyx truncate or shortly 5-toothed. Corolla tubular, the lobes spreading, nearly equal, obscurely 2-lipped or oblique. Stamens 4, in pairs, included in the tube; anther-cells diverging or divaricate. Style with 2 short ovate







Tecoma jasminoides Vol IV. 537

stigmatic lobes. Ovules numerous, in several rows on each placenta. Capsule (oblong in the Australian species) opening loculicidally in 2 very concave valves, the dissepiment transverse with relation to the valves, and not laterally dilated. Seeds overlaying each other in several rows, flat, broadly winged. Tall woody climbers. Leaves opposite, pinnate. Flowers in terminal panicles. Bracts minute; bracteoles none.

The genus is at present in a state of too much uncertainty to fix its geographical limits. The two Australian species are endemic, and with some botanists alone constitute the genus *Paedorea*. The two typical *Tecoma* are West Indian and South Africa, and many other more or less allied species from tropical and northern America, from Japan, E. India, and S. Africa had been included in it by De Candolle and others, but have been recently again separated from it.

Panicles loose. Corolla-tube under 1 in. long, the lobes less than half as long	1. <i>T. australis</i> .
Panicles compact, corymbose. Corolla-tube above 1 in., the lobes more than half as long	2. <i>T. jasminoides</i> .

1. **T. australis**, *R. Br. Prod.* 471. A tall woody glabrous climber, with more or less twining branches. Leaflets usually 5 to 9, ovate-oblong ovate-lanceolate or almost linear, entire or here and there coarsely crenate, from under 1 in. to nearly 3 in. long, but exceedingly variable, all small or all large, sometimes, especially on barren shoots, all coarsely toothed, and then occasionally all very small and much more numerous. Flowers of a yellowish-white, tinged inside with purple or red, in loose terminal panicles, leafy at the base, the primary and often the secondary branches opposite, the ultimate inflorescence cymose or racemose. Calyx smooth, 1 to 1½ lines long. Corolla-tube from about ½ to ¾ in. long, slightly curved and dilated upwards; lobes broad, not one-third as long as the tube, the 2 upper rather smaller with purple or red spots or streaks at their base, the throat bearded inside under the lower lip. Capsule 1½ to 3 in. long, usually acute at both ends, the valves hard and very concave. Seeds very flat, obovate, surrounded by a broad wing.—DC. *Prod.* ix. 225; Maund, *Botanist*, t. 8; *Bignonia Paedorea*, Vent. *Jard. Malm.* t. 43; Andr. *Bot. Rep.* t. 86; Bot. Mag. t. 865; *B. meonantha*, Link, *Enum. Hort. Berol.* ii. 130; *Tecoma meonantha*, G. Don, *Gen. Syst.* iv. 224; *T. Oxleyi* and *T. floribunda*, A. Cunn. in DC. *Prod.* ix. 225; *T. diversifolia*, G. Don, *Gen. Syst.* iv. 224; DC. *Prod.* ix. 225; *T. ochraceantha*, Kunth and Bouché, *Ind. Sem. Hort. Berol.* 1847, 12 (according to the character given and Seemann's verification).

N. Australia. Macdonnell Ranges in the interior, *McDonall Stuart*.

Queensland. Thirsty Sound, Koppel Bay, etc., *R. Brown*; evidently abundant in numerous localities, sent by many collectors, from Cape York, *Daemel*, to Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; in the interior to the Mantuan Downs, *Mitchell*.

N. S. Wales. Port Jackson to the Blue Mountains, frequent, *R. Brown*, *Sieber*, n. 265, and many others; northward to Clarence river, *Beckler*; New England, *C. Stuart*; southward to Illawarra, *A. Cunningham*, and Twofold Bay, *F. Mueller*; in the interior to St. George's and Peel's Ranges, *A. Cunningham*; Lachlan and Darling rivers, *L. Morton*; Lord Howe's Island, frequent, *Milne*.

Victoria. Sealer's Cove, Dandenong and Buffalo Ranges, *F. Mueller*.

2. **T. jasminoides**, *Lindl. Bot. Reg.* t. 2002. A tall glabrous woody climber, resembling the luxuriant specimens of *T. australis*, but with much

larger flowers. Leaflets usually 5 or 7, ovate and acuminate or ovate-lanceolate, 1 to 2 in. long, all entire and, as far as hitherto observed, not presenting the remarkable variations of *T. australis*. Flowers white, streaked with red in the throat, in compact terminal corymbose panicles. Calyx smooth, fully 3 lines long. Corolla-tube above 1 in. long, much more dilated upwards than in *T. australis*, the lobes very broad, more than half as long as the tube, the throat scarcely bearded inside or marked with 2 decurrent lines of short hairs. Fruit of *T. australis*, the seeds rather broader, almost obcordate, the wing either entirely surrounding them or chiefly on the two sides.—DC. Prod. ix. 225; Bot. Mag. t. 4004.

Queensland. Brisbane river, Moreton Bay, A. Cunninghamham, F. Mueller; Ipswich, *Nerast*.

N. S. Wales. Richmond river, Henderson; Clarence river (Beckler?).

2. SPATHODEA, Beauv.

(Sect. or gen. *Dolichandra* or *Dolichandrone*, Fenzl.)

Calyx spathaceous, herbaceous, acuminate, oblique, split on the upper edge. Corolla tubular, the lobes spreading, nearly equal, obscurely 2-lipped or oblique, imbricate in the bud. Stamens 4, in pairs, included in the tube, with a small fifth staminiodium; anther-cells parallel. Ovules crowded on the placentas but almost in a single row. Capsule linear, elongated, flattened or nearly terete, opening loculicidally in 2 concave or nearly flat valves, the dissepiment transverse with relation to the valves, but so much laterally dilated between the placentas as to appear flattened and parallel to the valves. Seeds in a single row to each placenta, flat, broadly winged on each side, but scarcely overlapping each other.—Small trees. Leaves scattered or irregularly whorled, entire or pinnate. Flowers in terminal racemes. Bracts minute; bracteoles none.

Like *Tecoma*, the genus is at present in a state of great confusion, and no two botanists are agreed as to its limits. The Australian species are certainly congeners of the Asiatic *S. crispata*, retained in the genus by *Burroug*, but it is as yet very uncertain how many of the American and African species (among the latter of which are the two species of which one must be considered as typical) are to be associated with them.

Leaves ovate, simple, mostly scattered	1. <i>S. alternifolia</i> .
Leaves simple or pinnate, mostly whorled, lanceolate or linear as well as their leaflets	2. <i>S. heterophylla</i> .
Leaves pinnate; leaflets long, terete, almost filiform	3. <i>S. filiformis</i> .

1. ***S. alternifolia***, R. Br. Prod. 472. A tree, evidently allied to *S. heterophylla*, and a variety only according to Seemann, but the few specimens known insufficient for determining the point. Leaves scattered, alternate or irregularly opposite, simple, ovate or broadly ovate-lanceolate, acuminate, very coriaceous, obliquely veined, narrowed into a long petiole, no pinnate ones occurring on any of the specimens known. Flowers unknown. Capsule as in *S. heterophylla*.—DC. Prod. ix. 209.

Queensland. Endeavour river, Banks and Solander; Burdekin river, F. Mueller.

2. ***S. heterophylla***, R. Br. Prod. 472. A scrubby tree of 10 to 15 ft., with a rugged bark, quite glabrous. Leaves crowded on the young shoots,



Stemmatopus (Stemmatopus) ...

1871

mostly in whorls of 3, simple or pinnate with 3 to 7 leaflets, varying from oblong-lanceolate to linear, from 1 to 3 in. long, the simple leaves usually lanceolate, from $1\frac{1}{2}$ to 5 in. long and narrowed into the petiole without articulation, both leaves and leaflets thickly coriaceous with very oblique veins. Flowers white, very fragrant, in short terminal simple racemes, the pedicels $\frac{1}{2}$ to 1 in. long. Calyx nearly 1 in. long. Corolla-tube slender, $1\frac{1}{2}$ in. long, dilated only at the top; lobes nearly $\frac{1}{2}$ in. diameter, broadly rounded with the margins undulate and crisped. Hypogynous disk thick and fleshy, the margin forming a short ring round the base of the ovary. Capsule from a few in. to above 1 ft. long, compressed (or nearly terete when fresh?); valves slightly concave; dilatations of the dissepiment rather thick and corky, almost reaching the margins of the valves. Seeds transversely oblong, the wing on each side as long as the seed itself.—DC. Prod. ix. 207; *Dolichandrone heterophylla*, F. Muell. Fragm. iv. 149.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Victoria river, *F. Mueller*; Carcening Bay, N.W. coast, *A. Cunningham*; Roebuck Bay, N.W. coast, *Marten*; King's Ponds, in the interior, *McDonall Stuart*.

Queensland. Rockingham Bay, *W. Hill, Dallachy*.

Seemann, in adopting the genus *Dolichandrone*, Fenzl, for this and the following *Spathodeas* (Ann. Nat. Hist. ser. 3, x. 31), places them in a section distinguished from *Tecoma* as having the "*Capsula marginicida*; septum valvis oppositum." That must, however, be giving a different meaning to the ordinary one of the term *marginicidal*, for the dehiscence is certainly loculicidal in all the three Australian species. The septum, although apparently parallel to the valves as above explained, is really transverse as correctly stated by Seemann, which is incompatible with a *marginicidal* dehiscence in the ordinary acceptation of the term.

3. **S. filiformis**, DC. Prod. ix. 209. A small tree, quite glabrous. Leaves scattered or, in some specimens, irregularly opposite, pinnate; leaflets in few distant pairs, very narrowly linear-terete, almost filiform as well as the rachis, 6 to 10 in. long in some specimens, half that length and more crowded in others, occasionally only 3 to the leaf (or rarely the leaves simple?). Flowers entirely like those of *S. heterophylla*, but the racemes shorter and the pedicels usually longer. Capsule above 1 ft. long, terete according to A. Cunningham, appearing somewhat compressed when dry, the structure and seeds as in *S. heterophylla*.—*Dolichandrone filiformis*, Fenzl; F. Muell. Fragm. iv. 149.

N. Australia. Copland Island, *A. Cunningham*; Victoria river, *F. Mueller*.

3. HAUSSMANNIA, F. Muell.

Calyx campanulate, truncate or minutely 5-toothed. Corolla tubular, incurved, dilated upwards; lobes 5, nearly equal, obscurely arranged in 2 lips induplicate-valvate in the bud. Stamens 4, inserted in the tube, longer than the corolla, with a fifth small staminodium; anther-cells diverging or divaricate. Hypogynous disk cupular, completely enclosing the ovary. Ovary short, slightly compressed, the dissepiment transverse. Ovules numerous, in several rows in each placenta. Style with 2 ovate stigmatic lobes. Fruit unknown.—Woody climber. Leaves opposite, compound. Flowers in short racemes. Bracts minute; bracteoles none.

The genus, as far as at present known, is limited to the single Australian species, and is very remarkable for the aestivation of the corolla. I do not see the affinity with the genus (or section of *Tecoma*) *Campsis*, suggested by F. Mueller.

1. *H. jucunda*, F. Muell. *Frugm.* iv. 148. A tall glabrous woolly climber. Leaflets 3, digitate and articulate at the end of a petiole of 1 to 2 in., each leaflet oval or elliptical, shortly acuminate, entire, membranous, pinniveined, narrowed into a short petiolule, 2 to 4 in. long, and occasionally the central leaflet confluent with one of the lateral ones, but no simple leaves in the specimen seen. Flowers "purple," in short racemes in the axils of the terminal pair of leaflets. Pedicels 2 to 3 lines long. Calyx 2 to 3 lines long. Corolla-tube about 1 in. long; lobes ovate, not 1 line long, hairy inside. Stamens hairy at their insertion below the middle of the tube, shortly exceeding the corolla-lobes. Hypogynous disk above 1 line long.—*Campsis Haussmannii*, F. Muell. l. c.

Queensland. Seaview Range, Rockingham Bay, *Dallachy*.

4. *DIPLANTHERA*, R. Br.

(*Bulweria*, F. Muell.)

Calyx campanulate, with 5 equal lobes, valvate and connivent in the bud, and often cohering in 2 lips or in pairs after the calyx is open. Corolla with a broad campanulate tube and 5 broad nearly equal lobes, imbricate in the bud. Stamens 4, without the fifth staminodium, exserted, involute in the bud; anthers with 2 linear distinct cells, parallel in the bud, at length divaricate. Ovary 2-celled; ovules very numerous, crowded in several rows on 2 distinct but approximate placentas in each cell. Style long, with 2 oval, flat, stigmatic lobes. Capsule oblong-fusiform, opening loculicidally in 2 woody valves leaving the placenta free. Seeds very flat, with a broad transparent wing.—Tree. Leaves simple, whorled or opposite. Flowers yellow, in terminal panicles.

The genus is limited to the single Australian species, unless it should include, as suggested by Seemann, the New Caledonian *Diplanthea*, which is, no doubt, closely allied in foliage and inflorescence. Our specimens of the latter have not the flowers in a sufficiently perfect state for examination, but Bureau describes the fifth sterile stamen or staminodium as present, and the two placentas of each cell of the ovary as distant from each other, leaving a bare space between them; and the fruit being unknown, it remains yet to be determined whether the two would be most appropriately considered as congeners or not. The fruit of *Diplanthera* closely resembles that of the Australian *Tecomas*.

1. *D. tetraphylla*, R. Br. *Prod.* 449. A moderate-sized or sometimes lofty tree, with a soft wood and spongy bark; the thick branchlets, under side of the leaves, and inflorescence covered with a thick soft tomentum, often assuming a golden or bronzed hue, and consisting of single or clustered but scarcely stellate hairs. Leaves crowded at the ends of the branches, in whorls of 4 or the first leaves of young shoots opposite, on short petioles, ovate, obtuse, entire, 1 to 2 ft. long or those immediately under the panicle 6 to 8 in., the upper surface glabrous or slightly scabrous. Flowers yellow, in a dense terminal panicle, nearly sessile above the last leaves, the primary branches whorled, each one dichotomously branched, with a flower shortly

pedicellate in each fork. Bracts linear, minute. Calyx coriaceous, about $\frac{1}{2}$ in. long, the lobes acute, as long as the tube. Corolla-tube shortly exceeding the calyx, the lobes as long as the tube, broadly rounded. Stamens and style exceeding the corolla by an inch or more, very divergent. Hypogynous disk rather thick. Capsule (only seen open with the valves detached) 2 to 3 in. long, the valves hard and woody, smooth inside with a longitudinal line probably where the dissepiment was attached, the placenta-bearing dissepiment not broad and rather thick. Seeds apparently ripe, but the embryo not perfect in those examined.—F. Muell. in Seem. Journ. Bot. v. 212; *Bulweria nobilissima* or *Tecomella Bulweri*, F. Muell. Fragm. iv. 117; *Deplanchea Bulwerii*, F. Muell. Fragm. v. 72.

Queensland. Endeavour river, *Banks and Solander*; Cape York, *M'Gillivray, Daemel*; Rockingham Bay, *Dallachy*.

F. Mueller describes the upper leaves as 2-foliolate. I have in vain sought for these bifoliolate leaves in his own as well as in the Hookerian herbarium. He was probably misled by the young shoots in some of the upper axils bearing only a pair of leaves, but always with the terminal bud between them.

ORDER LXXXVIII. ACANTHACEÆ.

Flowers irregular. Calyx more or less deeply divided into 5 lobes segments or distinct sepals, the upper one often smaller and sometimes wanting or the 2 lowest united into one. Corolla with a long or short tube, the limb either 2-lipped or of 5 spreading lobes, contorted or otherwise imbricate in the bud or expanded into a single lower lip. Stamens inserted in the tube, 4 in pairs or 2 only, the upper ones then reduced to staminodia or entirely wanting. Anthers 2-celled or 1-celled by the abortion of the other cell. Ovary superior, 2-celled, with 2 or more ovules or rarely a single one in each cell. Style simple, usually subulate, with an entire or 2-lobed stigma, the lobes not dilated and the upper one often reduced to a small tooth. Capsule opening loculicidally in 2 valves, usually elastically recurved and bearing the placentas along their centre. Seeds usually flat, attached to hooked processes from the dissepiment called *retinacula*, or in the first two tribes the seeds globular and resting on cup-shaped dilatations or mere papillae, sometimes almost inconspicuous. Albumen none. Embryo usually curved.—Herbs shrubs or rarely trees. Leaves opposite, entire or rarely toothed, or in a few species not Australian lobed. Flowers axillary or terminal, in spikes racemes or clusters, more or less bracteate, the primary inflorescence centripetal, the secondary sometimes dichotomous and centrifugal. Bracteoles rarely wanting and sometimes large and leafy.

A large Order, diffused over both the New and the Old World, chiefly within the tropics, a very few species occurring in more temperate regions, either in the northern or the southern hemisphere. Of the eleven Australian genera, ten are Asiatic, most of them extending into Africa, and several are also American. The station of the previously known species of the eleventh genus (*Graptophyllum*) is uncertain, probably the Eastern Archipelago.

In the delimitation of the genera of this Order I have endeavoured to follow the views of Dr. T. Anderson, who has elaborated the African and E. Indian species with great care and success, but unfortunately his detailed generic characters have not yet been published; and in the very concise synoptic enumeration in the 'Journal of the Linnean Society' a few

errors, probably clerical, render the distinctions upon which some of his groups are established rather difficult to make out. His arrangement has, however, dispelled much of the obscurity in which that of the 'Prodromus' by Nees had been involved.

TRIBE I. **Thunbergiæ**. *Corolla-limb with 5 nearly equal spreading lobes, contorted in the bud. Seeds globular, resting on a cup-shaped expansion of the placenta.*

Stem twining. Calyx an entire or toothed ring concealed within the bracteoles. Capsule beaked 1. THUNBERGIA.

TRIBE II. **Nelsoniæ**.—*Corolla-limb of 5 nearly equal lobes or 2-lipped, imbricate in the bud, the upper lobes or lip outside. Seeds globular. Retinacula none or reduced to minute papillæ.*

Corolla-lobes nearly equal. Stamens 2 2. NELSONIA.

Corolla-lobes nearly equal. Stamens 4 3. EBERMAYERIA.

TRIBE III. **Ruellieæ**.—*Corolla-lobes 5, nearly equal or 2-lipped, contorted in the bud. Seeds flat. Retinacula prominent.*

Corolla 2-lipped. Stamens 4. Ovules several in each cell. . . 4. HYGROPHILA.

Corolla-lobes nearly equal, spreading. Stamens 4. Ovules 6 or more in each cell 5. RUELLIA.

TRIBE IV. **Justicieæ**.—*Corolla 2-lipped or 1-lipped by the reduction of the upper one or rarely nearly equally 5-lobed, the lobes variously imbricate but not contorted in the bud. Seeds flat. Retinacula prominent.*

Corolla with one broad flat (lower) lip. Stamens 4. Leaves usually prickly-toothed 6. ACANTHIUS.

Corolla 2-lipped. Stamens 2.

Bracts small or not enclosing the flowers.

Anther-cells attached one higher up than the other. Upper corolla lip erect 7. JUSTICIA.

Anther-cells equal and parallel. Upper corolla-lip incurved. Flowers red 8. GRAPTOPHYLLUM.

Bracts in 2 pairs, forming an involucre enclosing 1 to 3 flowers.

Inner involucre bracts broad and appressed. Outer ones spreading subulate or spinous. Anthers 2-celled . . . 9. DICLIPTERA.

Involucre cylindrical, the 2 pairs of bracts nearly equal and usually connate, one pair within the other. Anthers 1-celled 10. HYPOESTES.

Corolla-lobes nearly equal, spreading. Stamens 2 11. ERANTHEMUM.

TRIBE I. THUNBERGIEÆ.—Corolla-limb with 5 nearly equal spreading lobes, contorted in the bud. Seeds nearly globular, resting on a cup-shaped expansion of the placenta.

* 1. THUNBERGIA, Linn. f.

Calyx reduced to an entire or many-toothed ring and concealed within 2 large bracteoles. Corolla-lobes 5, nearly equal, spreading, contorted in the bud. Stamens 4, included in the tube; anther-cells parallel. Ovules 2 in each cell of the ovary. Capsule globose and seed-bearing at the base, terminating in a flattened beak. Seeds globular, hollowed out on the inner face, and inserted on a cupular (sometimes very small) expansion of the placenta. Twining or rarely dwarf and prostrate herbs. Flowers in axillary pedicels or in terminal racemes.

The genus is limited to tropical Asia and Africa and southern Africa. The following species is probably introduced only in Australia.

* 1. **T. alata**, *Baj. in Sims, Bot. Mag. t. 2591*. A herbaceous softly pubescent or villous twiner. Leaves broadly angular-cordate, on rather long petioles which are always more or less winged. Flowers pale orange or in one variety white, with the tube purple inside, on axillary pedicels shorter than the leaves. Bracteoles herbaceous, ovate-lanceolate or ovate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Calyx reduced to a ring of from 10 to 12 small acute teeth. Corolla-tube shortly exceeding the bracteoles with 5 rounded spreading nearly equal lobes. — Nees in DC. Prod. xi. 58; Hook. Exot. Fl. t. 177; Bot. Mag. t. 3512.

Queensland. Rockhampton, *Thezel*. A native of the S.E. coast of Africa or of the Mascarene Islands, long since cultivated in India as well as European gardens, and probably introduced only in Australia.

TRIBE H. NELSONIÆ. — Corolla-limb with 5 nearly equal lobes or 2-lipped, the upper lobes or the upper lip outside in the bud. Seeds small, globular, the retinacula reduced to minute papillæ or quite inconspicuous.

2. NELSONIA, R. Br.

Calyx of 4 distinct segments, the lowest 2-fid. Corolla-lobes 5, nearly equal, the 2 upper ones outside in the bud. Stamens 2, included in the corolla-tube; anther-cells distinct, divergent; no staminodia. Ovules rather numerous; stigmatic lobes of the style unequal. Capsule 2-celled from the base, terminating in a seedless beak. Seeds small, globular, resting on minute scarcely conspicuous papillæ. — Diffuse herb. Flowers small, sessile in terminal leafy spikes.

The genus appears to be limited to a single species, a common tropical weed.

1. **N. campestris**, *R. Br. Prod. 481*. A diffuse or prostrate herb, the slender stems much branched and extending sometimes to above 1 ft., clothed as well as the foliage with long soft hairs which are often white and silky on the young shoots and inflorescence. Leaves oblong or elliptical, narrowed into a short petiole or rarely broadly ovate or almost orbicular, rarely exceeding $\frac{3}{4}$ in. except the radical and lowest which are sometimes much longer, the floral ones sessile, ovate, acute, 3 to 4 lines long, crowded or almost imbricate in short terminal spikes. Flowers nearly sessile, not exceeding the floral leaves. Calyx about 2 lines long, the upper and lower segments rather broader than the others, the lowest from minutely 2-toothed to deeply 2-lobed. Corolla-tube about as long as the calyx, the lobes rounded, 2 upper ones nearly $1\frac{1}{2}$ lines long, the 3 lower rather smaller. Capsule oblong-linear, not exceeding the floral leaves. — Endl. Iconogr. t. 79; *N. rotundifolia*, R. Br. l. c.; *N. tomentosa*, Dietr.; T. Anders. in Journ. Linn. Soc. ix. 450; the whole five species of *Nelsonia* and their numerous synonyms given by Nees in DC. Prod. xi. 65 to 67.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; between Victoria and Fitzmaurice rivers, *F. Mueller*; Albert river, *Henne*.

Queensland. Endeavour river, *Banks and Solander*; Rockhampton, *Dallachy*.

The species is a common tropical weed in Asia and Africa, and is already abundant in several parts of tropical America. The name *N. tomentosa* was attributed by Nees to

Willd. Sp. Pl. ed. 2. This is a mistake. Willdenow never published a second edition of his 'Species Plantarum,' and never knew the genus *Nelsonia*. The specific name *tomentosa* was first given by Roxburgh, and *Nelsonia tomentosa* is Dietrich's. R. Brown's very appropriate name, *N. campestris*, is much older than any of them.

3. *EBERMAIERA*, Nees.

Calyx divided to the base into 5 segments, the upper one broader than the others. Corolla-lobes 5, nearly equal, the 2 upper ones outside in the bud. Stamens 4, in pairs, included in the corolla-tube; anthers ovate, transverse, 2-celled. Ovules numerous; stigmatic lobes of the style unequal. Capsule oblong-linear, not beaked, 2-celled from the base. Seeds numerous, very small, nearly globular; retinacula reduced to minute papillæ or quite inconspicuous.—Herbs. Flowers small, sessile in the axils of the floral leaves or bracts, forming terminal dense or interrupted leafy or leafless spikes.

The genus comprises a considerable number of species from tropical Asia and Africa, with a few American ones. The only Australian species is a common Asiatic one.

1. *E. glauca*, Nees in DC. Prod. xi. 73. Stems at first simple and erect, at length diffuse prostrate or creeping and rooting at the nodes, with ascending or erect branches of $\frac{1}{2}$ to 1 ft., the whole plant slightly pubescent, the inflorescence often glandular. Leaves oblong-lanceolate or elliptical, obtuse, narrowed into a petiole, 1 to 2 in. long, the floral ones much smaller, mostly under $\frac{1}{2}$ in. Flowers nearly sessile in the axils of the floral leaves, between 2 leafy bracteoles about as long as the calyx, forming rather long leafy spikes, terminal or sometimes also in the axils of the upper stem-leaves. Calyx upper segment lanceolate, 3 to 4 lines long, lower ones linear and rather shorter. Corolla-tube about as long as the calyx, slightly dilated upwards; lobes short, obovate, obscurely 2-lipped. Capsule as long as the calyx.—T. Anders. in Journ. Linn. Soc. ix. 450; Wight, Ic. t. 1488.

II. Australia. Providence Hill and Mendenhall Range toward Fitzmaurice river, F. Mueller. Common in E. India and the Archipelago.

TRIBE III. RUELLIEÆ.—Corolla-limb with 5 nearly equal lobes contorted in the bud. Seeds flat, subtended by hooked retinacula.

4. *HYGROPHILA*, R. Br.

Calyx more or less deeply divided into 5 or rarely 4 lobes or segments. Corolla-limb 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes usually short and contorted in the bud. Stamens 4, in pairs, or in species not Australian only 2 perfect; anthers erect, the cells parallel and equal. Style subulate, with a small upper tooth. Ovules several in each cell of the ovary. Capsule oblong or linear, 2-celled from the base. Seeds flat; retinacula hooked.—Erect or decumbent herbs. Flowers sessile in axillary clusters.

A small genus, widely distributed over the tropical and subtropical regions of the New and the Old World. The only Australian species is a common Asiatic one.

1. *H. salicifolia*, Nees in Wall. Pl. As. Rav. and in DC. Prod. xi. 92. Stems erect or ascending, branched, from $\frac{1}{2}$ to $1\frac{1}{2}$ ft. high, glabrous or slightly pubescent with appressed hairs as well as the foliage. Leaves lan-

ceolate or almost linear, contracted into a short petiole, 3 or 4 in. long in stout specimens, half that size in others. Flowers usually 2 or 3 together in the axils of the stem-leaves, purple or pale blue (or yellow according to *Dal-lachy*). Bracteoles concave, acute, usually shorter than the calyx. Calyx pubescent, tubular, the lobes shorter than the entire part, the 2 lower ones often more united. Corolla-tube scarcely exceeding the calyx, upper lip 2-lobed, the lower lip 3-lobed, convex, with 2 lines of hairs decurrent from the sinus, the lobes all nearly equal, slightly contorted or almost valvate in the bud. Stamens inserted near the top of the tube. Capsule linear, about $\frac{1}{2}$ in. long. Seeds about 6 to 8 in each cell.—T. Anders. in Journ. Linn. Soc. ix. 456, with the synonyms adduced; *Ruellia salicifolia*, Vahl, Symb. iii. 81; *Hygrophila angustifolia*, R. Br. Prod. 479; Nees in DC. Prod. xi. 91.

N. Australia. Van Diemen's Gulf, N.W. coast, *A. Cunningham*; Victoria river, *F. Mueller*; Port Essington, *Armstrong*.

Queensland. Endeavour river, *Banks and Solander*, *R. Brown*; Rockingham Bay, *Dallachy*; Broad Sound, *Bowman*; Bed-lone Creek, *Thozet*; Moreton Bay, *W. Hill*.

It has appeared to me that the aestivation of the corolla-lobes is somewhat variable in *Hygrophila*, but the overlapping is often so slight as to make it difficult to ascertain it correctly from dried specimens.

5. RUELLIA, Linn.

(*Dipteracanthus and Cryphiacanthus*, Nees.)

Calyx more or less deeply divided into 5 lobes or segments. Corolla-lobes 5, nearly equal, spreading, contorted in the bud. Stamens 4, included in the corolla-tube; anther-cells parallel and equal. Ovules 6 or more in each cell of the ovary. Capsule oblong-linear or clavate, more or less contracted and seedless at the base, very rarely equally 2-celled throughout. Seeds flat; retinacula hooked, often denticulate at the top.—Herbs or rarely shrubs. Flowers usually blue, mostly axillary, solitary or clustered, rarely in terminal or axillary spikes.

A considerable genus, distributed over the warmer regions of the New and the Old World. The Australian species are perhaps all endemic, although one of them is very closely allied to an E. Indian one.

SECT. I. Dipteracanthus.—*Bracteoles usually longer and broader than the calyx. Capsule contracted or flattened and seedless at the base.*

Corolla with a slender tube of 1 in., the broader portion or throat half as long. Capsule $\frac{3}{4}$ in. Flowers pedunculate. 1. *R. bracteata*.

Corolla-tube very shortly slender at the base, the throat much longer.

Capsule $\frac{1}{2}$ in. long. Flowers nearly sessile.

Corolla-throat nearly 1 in. long 2. *R. primulacea*.

Corolla-throat scarcely $\frac{1}{2}$ in. long 3. *R. corynotheca*.

SECT. II. Cryphiacanthus.—*Bracteoles linear-subulate, shorter than the calyx or none. Capsule equally 2-celled from the base or nearly so.*

Flowers sessile in the axils or nearly so. Bracteoles shorter than the calyx 4. *R. australis*.

Flowers distant in axillary leafless spikes. Bracteoles very small 5. *R. spuriiflora*.

Flowers solitary on elongated pedicels. Bracteoles none 6. *R. acaulis*.

SECT. I. DIPTERACANTHUS.—Bracteoles usually longer and broader than the calyx. Capsule contracted or flattened and seedless at the base.

1. **R. bracteata**, *R. Br. Prod.* 479. Stems usually simple, 6 in. to 1 ft. high, more or less hirsute as well as the foliage. Leaves shortly petiolate, oblong or elliptical, the larger ones above $\frac{1}{2}$ in. long, the lowest small and obovate. Flowers blue, on axillary pedicels varying from $\frac{1}{2}$ in. to above 1 in. in length. Bracteoles herbaceous, oval-oblong, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, enclosing the base of the flower. Calyx-segments narrow, 2 to 3 lines long. Corolla with a very slender straight tube of about 1 in., the campanulate broad part or throat nearly half that length, the lobes broad and rounded, the margins slightly crisped. Stamens inserted near the top of the slender tube and reaching to the top of the throat. Capsule nearly $\frac{3}{4}$ in. long, contracted into a broad flattened seedless base. Seeds in the upper part, 7 or 8 in each cell.—Endl. *Iconogr. t.* 104 (the corolla-lobes more crisped than in any of the specimens seen); *Dipteracanthus bracteatus*, Nees in DC. *Prod.* xi. 113.

N. Australia. Arnhem N. and S. Bay, *R. Brown*.

Queensland. Cape York, *M'Gillivray*.

The E. Indian *Ruellia suffruticosa*, Roxb., is evidently closely allied to if not identical with *R. bracteata*.

2. **R. primulacea**, *F. Muell. Herb.* A perennial, apparently with the habit of *R. corynotheca*, but larger and more villous. Leaves ovate, nearly sessile, $\frac{1}{2}$ to 1 in. long. Flowers large, blue, nearly sessile in the upper axils. Bracteoles herbaceous, oval or oblong, much longer than the calyx. Calyx-segments narrow, 2 to 3 lines long. Corolla with an exceedingly short narrow base, the remainder of the tube much dilated, above 1 in. long, forming a long broad rather oblique throat; lobes broad, scarcely half as long as the tube. Capsule oblong-clavate, about $\frac{1}{2}$ in. long, contracted and seedless at the base. Seeds about 6 in each cell.

Queensland. Burdickin river, *F. Mueller*; Selheim and Elliot rivers, *Boorman*; Barcoo river, *M'Donnell Stuart* (the latter specimen doubtful, more villous, with narrower more petiolate leaves).

3. **R. corynotheca**, *F. Muell. Herb.* A perennial, usually shortly scabrous-pubescent, with rather slender decumbent or erect stems of 6 in. to nearly 1 ft. Leaves petiolate, mostly ovate and small, often under $\frac{1}{2}$ in. and rarely 1 in. long. Flowers nearly sessile in the upper axils. Bracteoles oblong linear or oblong, contracted at the base, longer than the calyx. Calyx $1\frac{1}{2}$ to 2 lines long, the segments united at the base. Corolla-tube 3 to 4 lines long, gradually dilated upwards, the lobes fully half as long as the tube. Capsule clavate, about $\frac{1}{2}$ in. long, the lower portion contracted and seedless, 2 lines broad above the middle. Seeds about 4 in each cell, rather large, all attached very near the middle of the capsule.

Queensland. Burdickin river, *F. Mueller*; Suttor river, *Boorman*, *Dorsay*. Very near the E. Indian *R. patula*, Jacq., but the corolla-tube appears to be shorter and not so slender, and there may be a few other trifling differences.

SECT. II. CRYPHIACANTHUS.—Bracteoles linear-subulate, shorter than the calyx or none. Capsule equally 2-celled from the base or nearly so.



4. **R. australis**, *R. Br. Prod.* 479. A small perennial with erect or diffuse branching stems often under 6 in. but sometimes nearly 1 ft. long, hirsute as well as the foliage or nearly glabrous. Leaves from obovate or oblong and under $\frac{1}{2}$ in. to oblong-lanceolate and 2 in. long, narrowed into a petiole. Flowers blue, axillary, sessile or very shortly pedicellate, with narrow bracteoles shorter than or very rarely as long as the calyx. Calyx-segments subulate-acuminate, 3 to 4 or even 5 lines long. Corolla-tube exceeding the calyx, gradually but considerably enlarged upwards; lobes spreading, more than half as long and sometimes nearly as long as the tube. Stamens inserted near the base of the tube and the anthers scarcely reaching above the middle. Capsule about $\frac{1}{2}$ in. long, mucronate, linear, not enlarged upwards, and usually 2-celled from the base. Seeds about 6 in each cell.—*Cav. Ic. vi. 62. t. 556*; *Nees in DC. Prod. xi. 151* as to Brown's synonym, but not the plant described; *Cryphiacanthus australis*, *Nees in DC. Prod. xi. 198*.

Queensland. Bay of Inlets, *Banks and Solander*; Thirsty Sound and Keppel Bay, *R. Brown*; Cape York, *McGillivray*; Rockhampton, *Dallachy*; Warwick, *Beckler*.

N. S. Wales. Port Jackson, *R. Brown* and others; Hastings river, *Beckler*; Liverpool plains, *C. Moore*; between the Darling and Cooper's Creek, *Neilson*.

Var. *scabra*. A coarse form. Leaves ovate or ovate-lanceolate, rigid and scabrous. Capsule rather larger.—Gilbert river, *F. Mueller*; Armadillo, *Barton*.

Var. *pusilla*. Very small and nearly glabrous. Leaves mostly oblong.—*R. pusillo*, *R. Br. Prod. 479*; *Dipteracanthus pusillo*, *Nees in DC. Prod. xi. 124*.—Burdekin river, *F. Mueller*; Rockhampton, *O'Shaunesy*; McGill Scrub, *C. Stuart*; Darling Downs, *Lav*; Armadillo, *Barton*; Port Jackson, *R. Brown*.

The garden plant described by *Nees* as *R. australis*, and which on his authority (he having named it so in my herbarium) I described as such in Maund's 'Botanist,' t. 175, is the E. Indian *Hemigraphis elegans*, *Nees*. Some specimens of *R. australis* much more closely resemble the *Hemigraphis hirta*, *T. Anders.*, or *Ruellia hirta*, *Vahl*.

5. **R. spiciflora**, *F. Muell. Herb.* Stems creeping and rooting at the base, ascending, under 1 ft. long in the specimens seen, loosely pubescent as well as the veins of the leaves underneath. Leaves petiolate, ovate or oblong, those of each pair very unequal, the larger one 1 to 2 in. long. Flowers distant, along slender axillary peduncles, forming interrupted spikes, each one sessile within a small linear-setaceous bract with still smaller bracteoles. Calyx-segments linear-setaceous. Corolla-tube rather broad, nearly $\frac{1}{2}$ in. long, the lobes about half as long as the tube. Stamens short. Capsule nearly $\frac{1}{2}$ in. long, apparently like that of *R. australis*, but not seen ripe.

Queensland. Archer's Creek, *Leichhardt*. The habit of the plant is that of *Asystasia gangetica*, *T. Anders.* (*A. coronandehana*, *Nees*), but the contorted corolla-lobes and the stamens are those of *Ruellia australis*.

6. **R. acaulis**, *R. Br. Prod.* 479. A dwarf almost stemless hirsute perennial, with a short branching stock, rarely emitting a few rather longer decumbent stems. Leaves mostly radical or nearly so, petiolate, oval-elliptical to oblong, obtuse, from under 1 in. to nearly 2 in. long. Flowers on pedicels varying from about the length of the calyx to three times that length, and always longer than the fruit. Bracteoles none. Calyx-segments 4 to 5 lines long. Corolla-tube about $\frac{1}{2}$ in. long, not much dilated, the lobes

about half as long as the tube. Stamens of *R. australis*. Capsule 6 to 8 lines long, 2-celled from the base.—Nees in DC. Prod. xi. 154.

Queensland. Bustard Bay, Bay of Inlets and Cape Grafton, *Banks and Solander*; Port Denison, *Fitzalan*; Burdekin river, *F. Mueller*; Suttro river, *Thozet*; Broad Sound, *Bowman*; Bogee river, *Dallachy*.

TRIBE IV. JUSTICIEÆ.—Corolla 2-lipped or 1-lipped by the reduction of the upper one, or rarely nearly equally 5-lobed, the lobes variously imbricate but not contorted in the bud. Seeds flat. Retinacula prominent, usually hooked.

6. ACANTHUS, Linn.

(*Dilivaria*, *Juss.*)

Calyx divided to the base into 4 distinct segments or sepals. Corolla with a very short tube; the upper lip short and truncate or entirely wanting, the lower lip large entire or 3-lobed. Stamens 4, exserted; anthers 1-celled, hirsute or ciliate. Ovules 2 in each cell of the ovary. Capsule 2-celled from the base. Seeds large, flat; retinacula thick.—Herbs or shrubs. Leaves usually prickly-toothed. Flowers in bracteate spikes.

A small genus, spread over tropical Asia, Africa, and southern Europe. The only Australian species is a common maritime plant in tropical Asia.

1. **A. ilicifolius**, *Linn.*; *T. Anders. in Journ. Linn. Soc.* ix. 501. An erect glabrous shrub of several feet. Leaves sessile or nearly so, oval or broadly oblong, 4 to 8 in. long, coriaceous and shining when full grown, bordered with undulate prickly teeth or short lobes or rarely entire, with a pair of divaricate short prickles at their base in the place of stipules, sometimes 4 or 5 lines long, sometimes very short or entirely wanting. Spikes terminal or in the upper axils, 6 in. to 1 ft. long. Bracts ovate, acute or obtuse, often at least half as long as the calyx; bracteoles similar but smaller, sometimes very small or wanting. Calyx-segments or sepals oblong, coriaceous, the 2 outer ones 6 to 8 lines long, the 2 inner ones smaller. Corolla upper lip exceedingly short truncate and coriaceous, the lower expanded into an obovate entire or shortly 3-lobed limb of above 1 in. Filaments hard, thick and shining, more than half as long as the lower lip. Anthers 3 to 4 lines long, very densely ciliate-hirsute. Capsule $\frac{3}{4}$ to 1 in. long, coriaceous, shining, very obtuse.—*R. Br. Prod.* 480; *Dilivaria ilicifolia*, *Juss.*; *Nees in DC. Prod.* xi. 268; *Wight, Ic.* t. 459.

N. Australia. Gulf of Carpentaria, *R. Brown*; Albert river, *Henne*.

Queensland. Cape York, *Daemel*; Endeavour river, *Banks and Solander*; Cape Conway, *A. Cunningham*; Rockhampton, *O'Shanesy, Thozet*.

A. bracteatus, *Vahl*, *Symb.* ii. 75. t. 40; *R. Br. Prod.* 480 (*Dilivaria bracteata*, *Juss.*; *Nees in DC. Prod.* xi. 269); is distinguished by almost all botanists as a species by the absence of bracts, and usually by the want of the stipular spines at the base of the leaves. Both the bracts and these spines are so very variable in size, that in the usually indifferent specimens in the collections before me, I am quite unable to ascertain whether there really are or not two distinct forms, all the other characters being precisely the same in both. A Malacca specimen answering to *Vahl's* figure, has smaller flowers than the common form, and the bracts very deciduous, but they are present under the buds on the young spikes. *Brown's* specimens of *A. bracteatus* have the subtending bract, but the bracteoles very minute or deficient and the stipular spines wanting.

7. JUSTICIA, Linn.

(Rostellaria and Rhaphidospora, Nees.)

Calyx divided to the base into 5 or 4 segments. Corolla 2-lipped, the upper lip erect, concave, entire or notched, the lower convex or with a longitudinal fold and veined in the centre, 3-lobed. Stamens 2; anther-cells oblique, one attached higher up than the other, the lower one usually mucronate or spurred. Ovules 2 in each cell of the ovary. Style usually entire. Capsule contracted or compressed and seedless at the base. Seeds flat; retinacula obtuse.—Herbs or shrubs. Flowers solitary or in clusters or cymes, axillary or forming terminal spikes or panicles. Bracts various.

A large genus, widely distributed over the tropical and subtropical regions of the globe. Of the five Australian species, two are common tropical weeds in Asia, another is closely allied to, it not identical with an Asiatic one, the remaining two are, as far as is known, endemic.

Flowers (small) in dense terminal bracteate spikes.

Bracts linear or lanceolate, acute, hispid or ciliate, not bordered. 1. *J. procumbens*.

Bracts obtuse, bordered by a broad white margin 2. *J. peploides*.

Flowers in axillary sessile clusters surrounded by a few broad obcordate bracts 3. *J. hygrophiloides*.

Flowers in pairs on axillary simple or forked peduncles. Bracts setaceous 4. *J. cavernarum*.

Flowers in a terminal dichotomous panicle 5. *J. eranthemoides*.

1. **J. procumbens**, Linn.; *T. Anders. in Journ. Linn. Soc.* ix. 511. A procumbent, prostrate or rarely erect annual, often extending to above 1 or 2 ft. when trailing, shorter when erect. Leaves usually oblong lanceolate or almost linear, the lower ones small and more ovate, sometimes all ovate from $\frac{1}{2}$ to 1 in. long or all narrow and then sometimes nearly 2 in. long; as well as the whole plant pubescent hirsute or nearly glabrous. Flowers pink or white, solitary under each bract, in terminal rather dense spikes of $\frac{3}{4}$ to above 1 in., with often 1 or 2 pairs of flowers at some distance below. Bracts linear-lanceolate or linear, acute, hirsute and ciliate, as long as the calyx; bracteoles rather smaller; calyx-segments 4 with occasionally a small fifth one, linear, 2 to 3 or rarely 4 lines long. Corolla-tube nearly as long as the calyx; upper lip short, erect; lower one broad, spreading, nearly as long as the tube. Lower anther-cell spurred and often empty. Capsule 3 to 4 lines long, the seedless base short.—*Rostellaria* (or *Rostellularia*) *procumbens*, Nees in Wall. Pl. As. Rar., and in DC. Prod. ix. 371; Wight, Ic. t. 1539; *Justicia juncea*, *J. media*, and *J. ascendens*, R. Br. Prod. 476; *Rostellularia media* and *R. juncea*, Nees in DC. Prod. ix. 374, 376; *R. pogonantha*, F. Muell. in Linnaea, xxv. 431; besides the numerous synonyms adduced by T. Anderson, l. c.

N. Australia. Gulf of Carpentaria, *R. Brown*; Victoria and Fitzmaurice rivers, *F. Mueller*; Cooper's River, *A. C. Gregory*.

Queensland. Endeavour river, *Banks and Solander*; Thirsty Sound, Broad Sound, Koppel Bay, etc., *R. Brown*, and from very numerous stations both on the coast and in the interior by most of the subsequent collectors.

N. S. Wales. Hunter's River, *A. Cunningham*; Hastings and Clarence rivers, *Becker*; from the Laichlan, *A. Cunningham*; and Darling river to the Barrier Range, *Victorian and other Expeditions*.

S. Australia. Near Akaba, *F. Mueller*; Mount Serle, *Walter & Atter*; Pardi's Ponds, *Waterhouse*; Flinders Range, *Howitt's Expedition*.

The species is a very common and variable weed throughout tropical Asia, extending into Africa. The Australian forms are chiefly narrow-leaved, either erect (*J. procumbens*, Br.) or procumbent (*J. subscandens*, Br.), but there are several others which at first sight look very distinct although connected by numerous intermediates. The most remarkable are one with very small ovate leaves, chiefly from Mount Serle, *Walter & Atter*, and New England, *C. Stuart*, and one with rather large ovate nearly sessile leaves, more glabrous and tending to dry black, from the Cleveley river, *Banks and Sclander*, Rockingham Bay, *Dallachy*, and a few others. In one luxuriant specimen of *F. Mueller's* from Victoria river, some of the bracts show a slight tendency to white margins, although but a very distant approach to those of *J. peploides*.

2. ***J. peploides*, T. Anders. in Jour. Linn. Soc. ix. 511.** Nearly allied to *J. procumbens*, with similar procumbent ascending or rarely erect stems inflorescence and flowers. Leaves ovate oblong or broadly lanceolate, on longer petioles than in *J. procumbens*, and not so much contracted at the base, usually pubescent. Spikes cylindrical, compact, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, very rarely interrupted at the base. Flowers white, smaller than in *J. procumbens*. Bracts and bracteoles obtuse, bordered by a broad white margin. Calyx-segments also somewhat membranous on the margin, but acute.—*Rastellaria peploides*, Nees, and other synonyms quoted by T. Anderson, l. c.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, *H. v. C. Stuart*. Also in E. India, but not so widely spread as *J. procumbens*.

3. ***J. hygrophiloides*, F. Muell. Fragm. vi. 89.** An erect densely-branched shrub, glabrous or minutely pubescent. Leaves ovate-lanceolate or lanceolate, obtuse, narrowed into a short petiole, 1 to $1\frac{1}{2}$ or rarely 2 in. long. Flowers white or according to some labels yellow, in axillary clusters of 2 to 6, surrounded by 3 or 4 very broadly obcordate or 2-lobed obtuse leafy bracts, at least as long as the calyx and rather broader than long. Calyx-segments 5 or rarely 4, linear-subulate, about 3 lines long. Corolla under $\frac{1}{2}$ in. long, the tube shorter than the calyx, the lips as long as the tube, the upper one concave and notched, the lower one broadly obovate, shortly divided into 3 broad nearly equal lobes. Stamens nearly as long as the upper lip, the lower anther-cell with a basal appendage or spur. Capsule oblong, obtuse, about as long as the calyx, the basal seedless part very variable in length, sometimes very short. Seeds 2 in each cell.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*, *C. Stuart*; Cape Conway, *A. Cunningham*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy*, *O'Shane*.

4. ***J. cavernarum*, F. Muell. Fragm. vi. 91.** Branches slender, apparently decumbent or divaricate, shortly hirsute or pubescent as well as the foliage and inflorescence. Leaves petiolate, ovate, 1 to $1\frac{1}{2}$ in. long. Peduncles in one axil of each pair of leaves, longer than the leaves, bearing at the end 2 sessile flowers, or forked with 2 sessile flowers at the end of each branch. Bracts and bracteoles setaceous, shorter than the calyx. Calyx-segments linear-setaceous, not 2 lines long. "Corolla small, pubescent outside, glabrous inside. Stamens 2; anthers 2-celled with the lower cell conspicuously spurred."

Queensland. Mountain caves near Rockhampton, *Thozet*. Described from fragment.

tary specimens in Herb. F. Mueller, which closely resemble the pubescent variety of the E. Indian *J. glabra*, Koen. (*Rhaphidostoma glabra*, Nees), but are not in a state to determine whether they really belong or not to that species.

5. **J. eranthemoides**, F. Muell. *Fragm.* vi. 90. Branches, veins of the under side of the leaves and inflorescence pubescent. Leaves petiolate, ovate-lanceolate or lanceolate, 2 to 2½ in. long. Flowers white, in terminal dichotomous corymbose panicles as long as the leaves. Bracts small, linear-subulate. Pedicels very short, without bracteoles. Calyx-segments linear-setaceous, about 2 lines long. Corolla 5 or 6 lines long, the tube nearly straight, dilated upwards; lips rather shorter than the tube, the upper one narrow, erect, notched, innermost in the bud, lower lip broader, with the prominent longitudinal fold of the genus, 3-lobed to the middle, the middle lobe broader than the others and overlapping them in the bud. Anther-cells inserted one higher than the other as in the rest of the genus, but the lower one without any basal appendage. Capsule narrow, 5 or 6 lines long, contracted flattened and seedless at the base. Seeds 2 in each cell.

N. S. Wales. Tweed river, *G. More*. Described from a single small specimen in Herb. F. Mueller, very different from any species known to me, especially in inflorescence, which, however, comes nearest to that of the section *Rhaphidospora*.

8. GRAPTOPHYLLUM, Nees.

(*Earlia*, F. Muell.)

Calyx divided to the base into 5 segments. Corolla-tube incurved, the limb 2-lipped, the upper lip concave, incurved, notched, the lower divided to the base into 3 nearly equal lobes. Stamens 2, ascending under the upper lip, anther-cells parallel, nearly equal, without basal appendages; staminodia 2. Ovules 2 in each cell of the ovary. Capsule oblong-clavate, contracted into a solid seedless base. Seeds flat; retinacula hooked.—Tall shrubs with glabrous shining leaves. Flowers red, in axillary or terminal clusters or short racemes. Bracts and bracteoles very small.

Besides the two Australian endemic species, there is only one known and commonly cultivated in tropical Asia, but of uncertain origin, probably from some of the early visited islands of the Eastern Archipelago. It is the *G. pictum*, Nees, known in our hothouses under the name of the *Caricature-plant*, and only differs in foliage from *G. ilicifolium*.

Leaves small oblong entire or minutely toothed 1. *G. Earlii*.
Leaves large, broadly ovate, prickly-toothed 2. *G. ilicifolium*.

1. **G. Earlii**, F. Muell. *Fragm.* vi. 87. A beautiful glabrous shrub or tree of 10 to 15 ft. (*Dallachy*). Leaves oblong-elliptical, acute or mucronulate, entire or with a few very small acute teeth, 7 to 1½ in. long. Flowers of a rich red, solitary in the axils or in clusters of very few. Pedicels 2 to 3 lines long, with minute bracts and bracteoles at the base. Calyx-segments narrow, acute, about 2 lines long. Corolla-tube incurved and dilated into a broad oblique throat above ½ in. long; upper lip incurved, much shorter than the tube, the lower lip rather shorter, equally divided into rather broad acute lobes. Filaments hairy at the base; staminodia filiform. Capsule hard, almost woody, about ¾ in. long. —*Earlia excelsa*, F. Muell. *Fragm.* iii. 160; *Thysacanthus Earlii*, F. Muell. *Fragm.* vi. 87.

Queensland. Near Rockhampton, *Dallachy*, *Thozet*. *Thyrsacanthus* is a South American genus with a very different habit and corolla.

2. ***G. ilicifolium*, F. Muell. Herb.** A glabrous shrub of 10 to 15 ft. (*Nerust*). Leaves very shortly petiolate, broadly ovate, obtuse or acute, bordered by irregular mucronate or prickly teeth, 3 to 4 in. long, coriaceous, much veined but very shining. Flowers of a rich red, in short dense clusters or racemes, axillary in our specimens. Pedicels short, with very small bracts and bracteoles at the base. Calyx-segments 3 to 4 lines long. Corolla-tube $\frac{3}{4}$ in. long, dilated into a broad throat but not so oblique nor so broad as in *G. Earlii*, the lips $\frac{1}{2}$ in. long, the upper one concave and incurved, the lower one divided to the base into 3 equal narrow lobes. Stamens as in *G. Earlii*. Capsule above 1 in. long.

Queensland. Mount Blackwood, Mackay district, *Nerust*. F. Mueller, *Fragm.* vi. 57, refers this as a variety to *G. Earlii*. It appears to me much nearer to *G. pictum*, of which it has the narrow-lobed corollas, and only differs, as far as I can ascertain, in foliage.

9. DICLIPTERA, Juss.

(*Brochosiphon*, *Nees*.)

Calyx deeply divided into 5 lobes or segments. Corolla-tube usually slender, dilated at the throat, the upper lip concave entire or notched, the lower broader nearly entire or 3-lobed, the middle lobe much broader than the others. Stamens 2, ascending under the upper lip; anthers 2-celled, the cells placed usually one higher than the other, but without any basal appendage. Ovules 2 in each cell. Capsule usually flat, shortly contracted and seedless at the base, the dissepiment separating from the valves when opened and turning upwards elastically with the retinacula. Seeds flat.—Herbs. Flowers 1 to 3 together, sessile within a flattened involucre of 2 bracts concealing the calyx, the involucre usually several in clusters or short cymes, in the axils of the floral leaves or forming terminal loose spikes or racemes, with usually 2 subulate or spinescent bracts outside the flat ones. Corolla, owing to the peculiar inflorescence, appearing frequently resupinate with relation to the main axis, the upper entire or 2-notched lip becoming the lowest.

A considerable genus dispersed over the tropical and subtropical regions of the New and the Old World. The two Australian species extend at least to Timor.

Involucral bracts orbicular, very flat, glabrous or glandular-pubescent, all in axillary clusters 1. *D. glabra*.
Involucral bracts ovate, aristate, convex, ciliate-hirsute on the upper side, the clusters forming terminal loose spikes or racemes 2. *D. spicata*.

1. ***D. glabra*, Dene. Herb. Tim.** 55. A much-branched annual of 1 to 2 ft., glabrous or the foliage sprinkled with a few rather rigid hairs. Leaves lanceolate or almost linear, mostly acute, contracted into a very short petiole, 1 to 2 in. long. Involucre either 2 sessile in the axils or 4 in pairs on 2 very short peduncles or several in a more or less cymose but very dense cluster, the involucral bracts very broadly ovate or nearly orbicular, mucronate-acute, glabrous or glandular-pubescent and ciliate, flat and usually unequal, the larger one 3 to 6 lines diameter, and always with an outer pair of



rigid linear-subulate spreading or recurved outer bracts or spines. Flowers within the bracts solitary or rarely 2 or 3, with minute bracteoles. Calyx 1 to 1½ lines long, divided to below the middle into linear-lanceolate lobes. Corolla shortly exceeding the bracteoles, the lips nearly as long as the tube, the upper one ovate and notched, the lower one broad and 3-toothed. Capsule very small, flat, nearly orbicular, usually 2-seeded.—Nees in DC. Prod. xi. 476; *Brochosiphon australis*, Nees, l. c. 192; *Didiplera armata*, F. Muell. Fragm. vi. 88.

N. Australia. Glenelg river, N.W. coast, *Macleay*; Upper Victoria river and Stirling Creek, *P. Mueller*; S. Goulburn island, *A. Cunningham*. The specimens agree perfectly with DeCaisne's character as well as with Cunningham's Timor specimens.

2. **D. spicata**, *Dne. Herb. Tim.* 56. An erect paniculately branched annual of 1 to 2 ft., the stem and leaves glabrous or minutely pubescent. Leaves lanceolate or almost linear, very acute and mucronate, almost aristate, narrowed into a petiole, 1 to 2 in. long, the floral ones narrower and shorter. Involucres usually 3 on a common peduncle in the axil of each floral leaf and sometimes a second shorter peduncle in the same axil with a single involucre, the clusters of involucres numerous in terminal racemes leafy at the base, the upper floral leaves reduced to subulate bracts. Involucral bracts ovate, acute and aristate, the margins recurved, the upper or inner surface convex and hirsute, the larger one of each pair 3 to 4 lines long, with an external pair of subulate bracts. Corolla slender, shorter than the bracts, the lips as long as the tube. Stamens 2. Capsule clavate, ovate. Seeds 2, muricate.—Nees in DC. Prod. xi. 479; *D. racemifera*, F. Muell. Fragm. vi. 89.

Queensland. Cape York, *Dawson*. Also in Timor; the typical specimens received from DeCaisne, as well as others in the Banksian Herbarium, agree precisely with the Australian ones.

10. HYPOESTES, R. Br.

Calyx more or less deeply divided into 5 lobes or segments. Corolla with a slender tube, deeply 2-lipped, the upper lip narrow entire or rarely notched, the lower 3-lobed. Stamens 2, often nearly as long as the corolla; anthers linear, 1-celled. Ovules 2 in each cell of the ovary. Style bifid at the top. Capsule compressed and seedless at the base, oblong or clavate. Seeds flat; retinacula subulate.—Herbs shrubs or small trees. Flowers solitary or 2 or 3 together, within a cylindrical or clavate involucre of 2 pairs of bracts often united to the middle, the inner pair alternating with the outer, the involucres in axillary clusters or spikes or in terminal panicles.

The genus is dispersed over Africa and tropical Asia. The Australian varieties or species appear to be endemic, but require further comparison with some forms from the Eastern Archipelago of which we have very imperfect specimens.

1. **H. floribunda**, *R. Br. Prod.* 474. An erect branching perennial, attaining 2 or 3 ft. and usually glabrous except the minutely glandular-pubescent inflorescence. Leaves ovate-lanceolate or almost linear, acutely acuminate, contracted into a rather long petiole, usually thin and membranous and 2 to 4 in. long, but occasionally much larger. Involucres usually numerous in dense axillary clusters or racemes or loose terminal panicles each in-

volucre tubular, concrete, 2 to 4 lines long, 4-lobed to about the middle, the lobes acute, the 2 inner ones rather smaller. Flowers solitary in the involucre or rarely 2 or 3 together, but the accessory ones mostly rudimentary. Calyx very thin, divided to about the middle, much shorter than the involucre. Corolla slender, about $\frac{3}{4}$ in. long or rather larger, the lips as long as the tube, the upper one linear and entire, the lower one much broader, very shortly 3-lobed. Stamens nearly as long as the lips. Capsule rather narrow, 5 to 6 lines long.—Endl. Iconogr. t. 105; *H. laxiflora* and *H. floribunda* (partly), Nees in DC. Prod. xi. 508, 509.

The following forms of this very variable plant might be distributed according to the inflorescence into three principal varieties or perhaps species:—

1. *Densiflora*. Involucres mostly 2 to 3 lines long in short dense spikes or clusters chiefly axillary.

N. Australia. Lagrange Bay, N.W. coast, *Marten*.

Queensland. Moreton Bay, *A. Cunningham*, *F. Mueller*; Rockhampton, *Thozet*; Edgcombe and Rockingham Bays, *Dallachy*; Nerool Creek, *Bowana*; Port Denison *Fitzalan*. (All nearly glabrous.)

Var. *canescens*. Branches inflorescence and under side of the leaves hoary with a very minute pubescence.—Cape York, *Daemel*.

Var. *pubescens*. Rather densely clothed with a scabrous or a soft pubescence.—Wide Bay, *Bidwell*; Burdekin river, *Leuchhardt*; N. coast of Arnhem's Land, *Kintley*.

N. S. Wales, Clarence river, *Beckler*.

2. *Paniculata*. Involucres usually 3 to 4 lines long, in elongated interrupted spikes, usually numerous in the upper axils, forming rather large terminal panicles.

N. Australia. South Goulburn Island, *A. Cunningham*; Cape Upstart, *Bynoe*; Port Essington, *Armstrong*.

Queensland. Shoalwater Bay, *R. Brown*.

Var. *angustifolia*. Leaves narrow-lanceolate or almost linear.—Victoria and Fitzmaurice rivers, *F. Mueller*.

3. *Distans*. Stems long and decumbent. Involucre few and very distant along the branches of a very loose terminal panicle.

N. Australia. Hunter's River, N.W. coast, *A. Cunningham*.

R. Brown's specimens belong to the paniculate form, which is included by Nees in his *H. laxiflora* B, with some Javanese specimens which appear to me quite different. Nees's typical *H. laxiflora* has a remarkably dense inflorescence and long subulate-acuminate involucre bracts, and agrees much better with the Javanese plants determined by him to be *H. rosea*, Decaisne, but not agreeing with Decaisne's character. Why he suppressed Decaisne's *H. rosea* to substitute a *H. rosea* of his own (p. 503) does not appear.

11. ERANTHEMUM, Linn.

Calyx deeply divided into 5 lobes or segments. Corolla-tube long and slender; limb spreading, 5-lobed, the lobes nearly equal, imbricate but not contorted in the bud. Stamens 2, inserted high up in the tube; anthers partially exerted, with 2 parallel and equal cells; staminodia 2, usually very small. Ovules usually 2 in each cell. Capsule oblong-clavate or linear, much contracted and seedless at the base. Seeds flat; reticula curved.—Herbs undershrubs or shrubs. Flowers solitary or in little cymes of 3 to 5, sessile or very shortly pedunculate in the upper axils or more frequently forming terminal interrupted spikes with the floral leaves reduced to small bracts. Bracteoles very small or none.

A considerable genus, dispersed over the tropical and subtropical regions of the New as well as the Old World. The two Australian species appear to be both endemic.



Conium maculatum L.
Poisonous Herb

Herb with a creeping rhizome and erect nearly simple stems. Flowers
in spikes 1. *E. variabile*.
Slender branching shrub. Flowers axillary 2. *E. tenellum*.

1. ***E. variabile*, R. Br. Prodr.** 477. A perennial with a creeping rhizome and ascending or erect simple or slightly branched stems varying from a few inches to above 1 ft. high, the whole plant glabrous pubescent or hirsute. Leaves petiolate, ovate oblong lanceolate or linear, 1 to 3 in. long. Flowers white, solitary or rarely in little cymes of 3 or 5, in the axils of bracts always very small and sometimes almost inconspicuous, forming racemes or spikes, sometimes short and dense in the upper axils, but mostly slender interrupted and terminal; pedicels very short. Calyx-segments linear-setaceous, varying from under 2 to above 4 lines in length. Corolla glabrous or pubescent, the slender straight tube 5 to 8 lines long; lobes oblong, from under half the length of the tube to nearly its length. Capsule about $\frac{1}{2}$ in. long, the lower half contracted and seedless.—Nees in DC. Prod. xi. 456.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Rockhampton and Rockingham Bay, *Dallachy*; Nerook Creek, Broad Sound, and Amity Creek, *Burmann*; W. L. Bay, *Bidwell*; Barlekin river, *F. Mueller*; Cape York, *M. Gillieray*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; Hastings and Clarence rivers, *Beckler*; Richmond river, *Fawcett*; New England, *C. Stuart*.

Var. *molle*. Leaves rather large, ovate, thin, softly pubescent. Flowers distant in slender leafless racemes.—Cape York, *Daemel*; Rockhampton, *Dallachy*.

Var. *lineare*. Leaves narrow linear.—Gilbert river, *F. Mueller*; Moreton Bay, *C. Stuart*.

Var. ? *grandiflorum*. Corolla-tube above 1 in. long; lobes above $\frac{1}{2}$ in.—Lord Howe's Island, *Milne*, a single specimen. Possibly a distinct species.

The plant figured in Paxt. Mag. xiii. 75 as *E. variabile* is a very different species, not Australian.

2. ***E. tenellum*, Benth.** An erect shrub of 2 to 3 ft. with slender scabrous-pubescent or glabrous branches. Leaves petiolate, ovate or oblong, those of each pair very unequal in size, the larger one sometimes rather above 1 in. long but usually half that size, and its opposite one much smaller. Flowers white, solitary in the axils, on short pedicels. Calyx-segments linear-setaceous, under 2 lines long. Corolla like the smaller form of *E. variabile*.

Queensland. Rockhampton, *Dallachy*; Broad Sound, *Bowman*. Evidently nearly allied to *E. tuberculatum*, Hook. Bot. Mac. t. 5405, but without the peculiar warts of that species, the flowers smaller, and the leaves differently shaped.

ORDER LXXXIX. PEDALINEÆ.

(Sesameæ, DC.)

Flowers irregular. Calyx 5-lobed or divided into 5 segments. Corolla tubular; lobes 5, spreading, often arranged in 2 lips, the lowest often rather larger than the others, imbricate or rarely valvate in the bud. Stamens 4, didynamous, with a small fifth staminodium, rarely only 2 perfect; anthers 2-celled, the cells opening longitudinally. Ovary of 2 or rarely 3 or 4 carpels, but divided, at least after flowering, into twice as many cells. Ovules in each cell either several

superposed in a single row or rarely solitary. Style filiform, with as many stigmatic lobes as carpels. Fruit dry, hard and indehiscent or opening in valves. Seeds with a thin testa. Albumen scanty or none. Embryo straight, with a very short radicle.—Herbs. Leaves all or at least the lower ones opposite. Flowers solitary in the axils of the floral leaves or bracts, the upper ones often forming a terminal raceme, with or without bracteoles.

A small Order, dispersed over the tropical and subtropical regions both of the New and the Old World, the only Australian genus extending to the Eastern Archipelago. De Candolle's arrangement, including *Sesameæ* and *Pedaleæ* in one Order, appears to be far the most natural; thus forming a small group connected on the one hand with *Gesneriaceæ* and *Bignoniaceæ* by their flowers, and on the other hand with *Verbenaceæ* by their ovary or fruit divided into twice as many cells as carpels.

1. JOSEPHINIA, Vent.

Calyx divided to the base into 5 segments. Corolla tubular, the lobes spreading, short, the lowest rather larger than the others. Stamens didynamous, included in the tube; anther-cells parallel, the connectivum usually tipped with a small gland. Ovary of 4, 6 or 8 cells, each with 1 erect ovule; stigmatic lobes 2, 3 or 4. Fruit hard and indehiscent, armed with conical prickles, shortly or not at all beaked. Seeds 1 in each cell, oblong, erect.—Herbs with the habit of *Sesamum*. Leaves opposite, entire, toothed or divided. Flowers in the upper axils on short pedicels without bracteoles.

The genus extends into the Archipelago. Of the three Australian species, one is also in the Archipelago, the two others are endemic. The solitary erect ovules and seeds connect this genus with *Verbenaceæ*, but the habit and corollas are those of *Pedalineæ*.

Leaves glabrous or nearly so, quite entire. Ovary usually 8-celled.

Fruit with a small terete or conical beak 1. *J. grandiflora*.

Leaves pubescent underneath, the lower ones coarsely toothed. Ovary usually 6-celled. Fruit with a triangular truncate beak 2. *J. imperatricis*.

Plant densely villous. Lower leaves divided into 3 distinct segments.

Ovary usually 4-celled. Fruit not beaked 3. *J. Eugeniæ*.

1. *J. grandiflora*, R. Br. *Prod.* 520. Stems erect or diffuse (2 to 3 ft. high?), glabrous or sprinkled with a few minute hairs. Leaves petiolate, lanceolate or the lower ones ovate-lanceolate, all quite entire, $1\frac{1}{2}$ to 3 in. long, glabrous or minutely and sparingly pubescent underneath. Pedicels shorter than the petiole. Calyx-segments narrow, acuminate, about 2 lines long, the upper one usually shorter. Corolla at least 1 in. long, pubescent outside, the tube gibbous at the base on the upper side, gradually dilated upwards; lobes broad, the 4 upper ones nearly equal, the lower twice as long and broader than the others. Ovary in the flowers examined 8-celled; stigmatic lobes 4 (sometimes 3 according to Endlicher's figure). Fruit ovoid-globular, under $\frac{1}{2}$ in. diameter, very hard, villous with short soft hairs, armed with thick conical very unequal prickles, the persistent thickened base of the style forming a cylindrical or slightly conical beak, sometimes very short, sometimes at least as long as the prickles.—Endl. *Iconogr.* t. 106.

Queensland. Endeavour Straits, *R. Brown*; Low Island, *R. Brown*, *Heume*; islands of Howick's group, *P. Mueller*; Three Isles and Lizard Island, *M'Gillivray*; Pelican and Haggerstone Islands, *A. Cunningham*.

Decaisne (Herb. Tim. 76), followed by De Caudolle (Prod. ix. 255) and by F. Mueller (Fragm. vi. 163), unites this with *J. imperatricis*, but probably without having had good specimens at his disposal, for, besides the indumentum, the foliage corolla and fruit appear to me to be different. Probably also neither of these authors had consulted Ventenat's plate, for they all copy the misquotation of its number, originating with Brown at a time when complete copies of the work may not have reached England. Endlicher in the above-quoted figure (from Bauer's drawings) has reversed the fruit (fig. *n*), so as to make the beak appear as a pedicel; the seeds *o* are also reversed.

2. ***J. imperatricis*, Vent. Jard. Malm. t. 67 (not 103).** An erect herb of 2 or 3 ft. Leaves petiolate, the lower ones cordate-ovate, coarsely toothed, 3 or 4 in. long, the upper ones much smaller, broadly lanceolate, entire or nearly so, all minutely but rather densely pubescent underneath. Pedicels shorter than the petioles. Calyx-segments nearly equal. Corolla "with a short tube, much dilated upwards, the lower lobe not much larger than the others." Ovary in the specimens seen 6-celled. Fruit ovoid, villous, hard, armed with conical prickles as in *J. grandiflora*, but terminating in a thick obtuse or truncate, very prominently 3-angled beak, as long as or longer than the prickles.—R. Br. Prod. 520.

N. Australia. N.W. coast, *Baudia* (Herb. Banks). I have also a Timor specimen, sent by Decaisne, probably from the same Expedition, and a specimen in the Hookerian herbarium from Java sent by Miquel (probably *J. celebica*, Blume) appears to be the same species. In Ventenat's plate the fruit, fig. *l*, is reversed, as in Endlicher's, the beak appearing as a stipes. I have not yet seen good corollas, but, besides Decaisne's description, the above quoted figure shows them to be much shorter and broader than in *J. grandiflora*.

3. ***J. Eugeniæ*, F. Muell. in Hook. Kew Journ. ix. 370. t. 11.** Stems procumbent ascending or erect, attaining 2 ft. or rather more, every part of the plant densely villous with articulate simple or branched hairs. Lower leaves on long petioles mostly divided into 3 petiolulate segments, the segments as well as the upper simple leaves oblong or lanceolate, coarsely toothed, 1 to 2 in. long; the uppermost floral ones small, lanceolate and entire. Flowers pink, very small, on short pedicels in the upper axils. Calyx-segments linear, obtuse, very hispid, scarcely above 1 line long. Corolla about 3 lines long, hirsute outside, the 4 upper lobes short and broad, the lowest one larger. Ovary 4-celled; stigmatic lobes 2, oblong-linear. Fruit ovoid, very hirsute, about $\frac{3}{4}$ in. long, the prickles small, often not exceeding the hairs, without any beak, but slightly raised ribs across the summit.

N. Australia. Upper Victoria river, *F. Mueller*.

Queensland. Suttor river, *Bowman*.

S. Australia. Near Cooper's Creek (*Herb. F. Mueller*).

The following references have been accidentally omitted:—

P. 44. *Leschenaultia filiformis*, add: F. Muell. Fragn. vi. t. 48.

P. 44. *Leschenaultia agrostophylla*, add: F. Muell. Fragn. vi. t. 47.

P. 46. *Velleia connata*, add: F. Muell. Lithogr. t. 49.

P. 340. *Marsdenia leptophylla*, add: *Bidaria leptophylla*, F. Muell. in Trans. Phil. Inst. Vict. iii. 60.

P. 344. *Gymnema stenophyllum*, add: *Bidaria erecta*, F. Muell. in Trans. Phil. Inst. Vict. iii. 59.



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